DL SECTION DRIVELINE С

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< PRECAUTION > PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT **PRF-TENSIONER**" INFOID:000000013326326

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual. DLN

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- · Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Н Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precautions For Removing Battery Terminal

 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 2 minutes.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

 For vehicles with the two batteries, be sure to connect both batteries before turning ON the ignition switch. NOTE:

If the ignition switch is turned ON with any one of the terminals of the two batteries disconnected, then DTC may be detected.

· After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC. NOTE:

The removal of 12V battery may cause a DTC detection error.

Service Notice or Precautions for Transfer

- Never reuse transfer fluid, once it has been drained.
- Check the fluid level or replace the fluid only with the vehicle parked on level ground.
- · During removal or installation, keep inside of transfer clear of dust or dirt.
- Replace all tires at the same time. Always use tires of the proper size and the same brand and pattern. Fitting improper size and unusually worn tires applies excessive force to vehicle mechanism and can cause longitudinal vibration.
- Disassembly should be done in a clean work area, it is preferable to work in dustproof area.
- Before proceeding with disassembly, thoroughly clean the transfer. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.



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PRECAUTIONS

< PRECAUTION >

- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the transfer is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, use it.
- Observe the specified torque when assembling.
- Clean and flush the parts sufficiently and blow-dry them.
- · Be careful not to damage sliding surfaces and mating surfaces.
- Clean inner parts with lint-free cloth or towels. Do not use cotton work gloves and rags to prevent adhering fibers.

PREPARATION

[TRANSFER: TX91A]

special Service Tools		INFOID:000000001255608
he actual shapes of the TechMate tools may diffe	r from those of the special service tools illustrated here.	
Tool number (TechMate No.) Tool name	Description	
KV40104710 Drift	Installing rear oil seal a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	
Commercial Service Tools		INFOID:0000000125560
Commercial Service Tools	Description	INFOID:0000000125560
Tool name Drift	Description Installing front oil seal a: 70 mm (2.76 in) dia. b: 63 mm (2.48 in) dia.	INFOID:0000000125560
Tool name Drift Flange wrench	Description Installing front oil seal a: 70 mm (2.76 in) dia. b: 63 mm (2.48 in) dia. zzal003D Removing and installing sel	INFOID:0000000125560

Name	Description
Sealant (Hylomar 102 silicone or equivalent)	Thread of filler plug Thread of drain plug

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< PREPARATION >

COMPONENT PARTS

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION COMPONENT PARTS

Component Parts Location

INFOID:000000012556089



A Center dash area

B Transfer

No.	Component	Function
1	Combination meter	 Mainly transmits the following signals to transfer control unit via CAN communication. Vehicle speed signal Mainly receives the following signals from transfer control unit via CAN communication. 4WD warning lamp signal 4WD mode indicator lamp signal ATP warning lamp signal For detailed installation location, refer to <u>MWI-8. "METER SYSTEM : Component Parts Location"</u>.
2	ВСМ	 Mainly transmits the following signals to transfer control unit via CAN communication. Sleep wake up signal Stop lamp switch signal Mainly receives the following signals from transfer control unit via CAN communication. Sleep-ready signal For detailed installation location, refer to <u>BCS-5</u>, "<u>BODY CONTROL SYSTEM : Component Parts Location</u>".
3	ECM	 Mainly transmits the following signals to transfer control unit via CAN communication. Engine speed signal For detailed installation location, refer to <u>EC-34</u>. "Component Parts Location" (CUM-MINS 5.0L) or <u>EC-1269</u>. "Component Parts Location" (VK56VD).

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

No.	Component	Function	٨
4	тсм	 Mainly transmits the following signals to transfer control unit via CAN communication. Gear position signal Output shaft revolution signal For detailed installation location, refer to <u>TM-15</u>, "<u>A/T CONTROL SYSTEM</u> : <u>Component</u> <u>Parts Location</u>" (RE6R01A) or <u>TM-265</u>, "<u>A/T CONTROL SYSTEM</u> : <u>Component Parts</u> <u>Location</u>" (RE7R01B). 	B
5	ABS actuator and electric unit (control unit)	 Mainly transmits the following signals to transfer control unit via CAN communication. Each wheel speed signal For detailed installation location, refer to <u>BRC-9</u>, "Component Parts Location". 	С
6	Transfer control unit	Refer to DLN-11, "Transfer Control Unit".	
7	Transmission assembly	_	DEN
8	4WD shift switch	Refer to DLN-12, "4WD Shift Switch".	_
9	Transfer assembly	_	E
10	Range sensor	Refer to <u>DLN-12. "Range Sensor"</u> .	
(1)	Mode sensor	Refer to <u>DLN-12. "Mode Sensor"</u> .	F
(12)	Transfer motor	Refer to <u>DLN-11, "Transfer Motor"</u> .	
(13)	Transfer rotary position sensor	Refer to DLN-11, "Transfer Rotary Position Sensor".	G

Transfer Control Unit

Н Transfer control unit controls 4WD mode (2WD \Leftrightarrow 4H \Leftrightarrow 4LO) by input signals of each sensor and each switch, and it directs shifts from 4WD shift switch.

Transfer Rotary Position Sensor

- · Transfer rotary position sensor is installed to back side of transfer assembly.
- · Transfer rotary position sensor detects rotation status of transfer motor and transmits signal to transfer control unit.



Transfer Motor

- Transfer motor is installed to left side of transfer assembly.
- Transfer motor operates according to signal from transfer control unit and switches 4WD mode (2WD \Leftrightarrow 4H \Leftrightarrow 4LO).



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COMPONENT PARTS

< SYSTEM DESCRIPTION >

Mode Sensor

- Mode sensor is installed to top of transfer assembly.
- Mode sensor detects engagement status of 2WD-4H sleeve and transmits signal to transfer control unit.

Item		4WD mode	
item	2WD 4H 4LO		4LO
Mode sensor	OFF	ON	ON

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Range Sensor

- · Range sensor is installed to top of transfer assembly.
- Range sensor detects engagement status of 4H-4LO sleeve and transmits signal to transfer control unit.

ltem .			4WD	mode	
		2WD	4H	(N)*	4LO
Range sensor	Switch 1	OFF	OFF	OFF	ON
Range Selisor	Switch 2	OFF	OFF	ON	ON

*: This is neutral position of $4H \Leftrightarrow 4LO$.

4WD Shift Switch

- The 4WD shift switch is installed to cluster lid C lower.
- Operating the 4WD shift switch at an engine start enables the selection of 4WD mode (2WD ⇔ 4H ⇔ 4LO).



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< SYSTEM DESCRIPTION >

STRUCTURE AND OPERATION

Sectional View

[TRANSFER: TX91A]

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Rear companion flange 1.

- 4. Drive chain
- 7. H-L sleeve
- 10. Input bearing
- 13. Range fork
- 16. Front bearing
- 19. Shift rail gear

Torque Split Mechanism

TORQUE DISTRIBUTION FLOW

2WD Mode

- 2. Extension case
- 5. Sprocket
- Sun gear 8.
- 11. Input shaft
- 14. Actuator shaft
- 17. Rear case
- 20. Shift rail bearing

	11110000311
3.	Main shaft
6.	2-4 sleeve
9.	Front case
12.	Internal gear
15.	Front companion flange
18.	Mode fork
21.	Rear bearing

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >



(B)



4H Mode

DLN-14

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]



Р

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >



< SYSTEM DESCRIPTION >

SYSTEM 4WD SYSTEM

4WD SYSTEM : System Description

- 4WD mode is selectable among 2WD mode, 4H mode, and 4LO mode by operating the 4WD shift switch.
- In accordance with fail-safe function, when system is malfunctioning, 4WD warning lamp on combination meter turns ON and 4WD control stops. For fail-safe function, refer to <u>DLN-27</u>, "Fail-Safe".





Signal with Communication Line

Major signal transmission between each unit via CAN communication lines are shown in the following table.

Component parts	Signal item	
ECM	Mainly transmits the following signals to transfer control unit via CAN communication. Engine speed signal 	N
Combination meter	 Mainly transmits the following signals to transfer control unit via CAN communication. Vehicle speed signal Mainly receives the following signals from transfer control unit via CAN communication. 4WD warning lamp signal 4WD mode indicator lamp signal ATP warning lamp signal 	0
BCM	 Mainly transmits the following signals to transfer control unit via CAN communication. Sleep wake up signal Stop lamp switch signal Mainly receives the following signals from transfer control unit via CAN communication. Sleep-ready signal 	P

[TRANSFER: TX91A]

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SYSTEM

< SYSTEM DESCRIPTION >

Component parts	Signal item
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to transfer control unit via CAN communication. • Each wheel speed signal
ТСМ	Mainly transmits the following signals to transfer control unit via CAN communication.Gear position signalOutput shaft revolution signal

OPERATIONAL CONDITIONS FOR 4WD MODE

4WD mode	Shifting condition
$2WD \Leftrightarrow 4H$	Shifting between the 2WD and 4H modes must be performed at speed below 100 km/h (62 MPH).
4H ⇔ 4LO	 Engine: Running (Stop the vehicle) Vehicle speed: 0 km/h (0 MPH) Brake pedal: Depress Selector lever: N position Steering wheel: Straight-ahead position

NOTE:

• The indicator blinks when shifting between 4H and 4LO.

• Some noise may be heard as the system shifts or engages; this is normal.

4WD SYSTEM : Fail-Safe

INFOID:000000012556102

DTC	Vehicle condition
P1804	No impact to vehicle behavior.
P1808	4WD mode cannot be switched by operating 4WD shift switch.
P1809	4WD mode cannot be switched by operating 4WD shift switch.
P180C	4WD mode cannot be switched by operating 4WD shift switch.
P180D	4WD mode cannot be switched by operating 4WD shift switch.
P180F	4WD mode cannot be switched by operating 4WD shift switch.
P1811	4WD mode cannot be switched by operating 4WD shift switch.
P1813	When malfunction occurs due to duplicate input, the control continues according to the 4WD mode priority (2WD \rightarrow 4H \rightarrow 4LO). (For malfunction with no input, 4WD mode running at the occurrence of malfunction is maintained.)
P1814	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)
P1816	4WD mode cannot be switched by operating 4WD shift switch.
P1817	4WD mode cannot be switched by operating 4WD shift switch.
P1818	4WD mode cannot be switched by operating 4WD shift switch.
P1819	4WD mode cannot be switched by operating 4WD shift switch.
P181B	4WD mode cannot be switched by operating 4WD shift switch.
P181C	4WD mode cannot be switched by operating 4WD shift switch.
P1820	4WD mode cannot be switched by operating 4WD shift switch.
P182A	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)
P1855	4WD mode cannot be switched by operating 4WD shift switch.
P1867	No impact to vehicle behavior.
P186C	4WD mode cannot be switched by operating 4WD shift switch.
U1000	4H – 4LO switching is prohibited when a malfunction occurs in communications of ECM, TCM, or BCM.
U1010	4WD mode cannot be switched by operating 4WD shift switch.

WARNING LAMPS/INDICATOR LAMPS

SYSTEM

[TRANSFER: TX91A]

WARNING LAMPS/INDICATOR LAN	IPS: 4WD Warning Lamp
NOTE: The 4WD warning lamp may not be equipped b	ay grade.
DESIGN/PURPOSE	B
	C
	E
	JPNIA1896ZZ
Turns ON after turning ON the ignition switch (e is normal.	engine stop) and turns OFF after the engine is started if system F
LIGHTING AND SHUTOFF CONDITION	G
Condition	4WD warning lamp
4WD system malfunction	ON H
Large difference in diameter of front/rear tires	Slow blinking: 1 time/2 seconds (Continuing to blink until turning ignition switch OFF)
Other than above (system is normal.)	OFF
WARNING LAMPS/INDICATOR LAN	IPS : ATP Warning Lamp
	J
When the A/T shift selector is in P position, the	e vehicle may move if
the transfer in neutral. ATP warning lamp warns	s the driver. K
	M
	.JSDIA683522
LIGHTING CONDITION	N
When all of the condition listed below are satisf	ïed:
• When the A/T is in the parking condition and	transfer gear is in the neutral.
SHUTOFF CONDITION	find.
 Ignition switch is in a position other than ON. 	P
 Transfer gear is in a position other than neutr A/T is in a position other than parking condition 	al. on.
INFORMATION DISPLAY (COMBIN	NATION METER)
INFORMATION DISPLAY (COMBIN	ATION METER) : 4WD Warning
DESIGN/PURPOSE	

< SYSTEM DESCRIPTION >

DLN-19

< SYSTEM DESCRIPTION >

4WD warning is displayed when the 4WD system has a malfunction. 4WD warning indicates that the vehicle is in fail-safe mode.

Symbol	Message	Condition
4WD	4WD Error See Owner's Manual	4WD system malfunction.
JPNIA18962Z		

SYSTEM DIAGRAM



SIGNAL PATH

- The transfer control unit judges and decides a mode from among normal mode and fail-safe mode, according to signals received from each switch, sensor, and control unit.
- The transfer control unit transmits 4WD warning signal to the combination meter via CAN communication when judging fail-safe mode.
- The combination meter displays 4WD warning on the information display when receiving 4WD warning signal transmitted from the transfer control unit.

WARNING CONDITION

4WD warning is displayed when the 4WD system goes into fail-safe mode.

WARNING CANCEL CONDITION

When any of the conditions listed below is satisfied:

- Ignition switch is in a position other than ON.
- 4WD warning becomes invisible when the 4WD system returns to normal.

INFORMATION DISPLAY (COMBINATION METER) : ATP Warning

INFOID:000000012556104

DESIGN/PURPOSE

When the A/T shift selector is in P position, the vehicle may move if the transfer in neutral. ATP warning is displayed to inform this condition to the driver.

Symbol	Message	Condition	
— Pull the parking brake		A/T is in the parking condition and transfer gear is in the neutral.	

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

SYSTEM DIAGRAM



SIGNAL PATH

- The transfer control unit judges and decides position of A/T and transfer gear, according to signals received from each sensor and TCM.
- The transfer control unit transmits ATP warning signal to the combination meter via CAN communication E when judging A/T is in the parking condition and transfer gear is in the neutral.
- The combination meter displays ATP warning on the information display when receiving ATP warning signal transmitted from the transfer control unit.

WARNING CONDITION

ATP warning is displayed when the A/T is in the parking condition and transfer gear is in the neutral.

WARNING CANCEL CONDITION

When any of the conditions listed below is satisfied:

- Ignition switch is in a position other than ON.
- Transfer gear is in a position other than neutral.
- A/T is in a position other than parking condition.

INFORMATION DISPLAY (COMBINATION METER) : 4WD Indicator

DESIGN/PURPOSE

Design	Purpose	J
n-n	Displays driving conditions selected by the 4WD shift switch while engine is run-	K
4LO	 ning. When the 4WD warning lamp is turned ON, all 4WD indicator will turn OFF. Indicator flashes if transfer gear does not shift completely into 4H ⇔ 4LO. In this condition, the transfer gear may be in neutral. 	L
		M
JSDIA6835	22	

F

Н

INFOID:000000012556105

DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

CONSULT Function

INFOID:000000012556108

[TRANSFER: TX91A]

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Mode	Function
All DTC Reading	Display all DTCs or diagnostic items that all ECUs are recording and judging.
Work Support	This mode enables a technician to adjust some devices faster and more accurately.
Self Diagnostic Results	Self-diagnostic results and freeze frame data can be read and erased quickly.*
Data Monitor	Monitor the input/output signal of the control unit in real time.
CAN Diagnosis	This mode displays a network diagnosis result about CAN by diagram.
CAN Diagnosis Support Monitor	It monitors the status of CAN communication.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.

*: The following diagnosis information is erased by erasing.

DTC

Freeze frame data (FFD)

ECU IDENTIFICATION

Transfer control unit part number can be read.

SELF DIAGNOSTIC RESULT Refer to <u>DLN-28, "DTC Index"</u>.

When "PRSNT" is displayed on self-diagnosis result.

• The system is presently malfunctioning.

When "PAST" is displayed on self-diagnosis result.

• System malfunction in the past is detected, but the system is presently normal.

FREEZE FRAME DATA (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT.

Item name	Display item
IGN COUNTER (0 – 39)	 The number of times that ignition switch is turned ON after the DTC is detected is displayed. When "0" is displayed: It indicates that the system is presently malfunctioning. When except "0" is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. NOTE: Each time when ignition switch is turned OFF to ON, numerical number increases in 1→2→338→39. When the operation number of times exceeds 39, the number do not increase and "39" is displayed until self-diagnosis is erased.

DATA MONITOR **NOTE**:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item (Unit)	Remarks		
4L SWITCH [On/Off]	4WD shift switch signal (4LO) is displayed.		
4H SWITCH [On/Off]	4WD shift switch signal (4H) is displayed.		
2WD SWITCH [On/Off]	4WD shift switch signal (2WD) is displayed.		
4WD MODE [BOTNG/SWTNG/2WD/4L/LOCK]	Control status of 4WD mode is displayed. (LOCK means 4H of 4WD mode)		
IGN SW [On/Off]	Ignition switch status is displayed.		
BRAKE SWITCH [On/Off]	Stop lamp switch signal status via CAN communication line is displayed.		

Revision: March 2016

DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< SYSTEM DESCRIPTION >

[TRANSFER: TX91A]

Monitor item (Unit)	Remarks	
SLCT LVR POSI [D/N/R/P]	A/T shift selector position via CAN communication line is displayed.	— A
MODE SENSOR [On/Off]	Mode sensor status is displayed.	
RANGE SENSOR 2 [On/Off]	Range sensor status is displayed.	В
RANGE SENSOR 1 [On/Off]	Range sensor status is displayed.	
4WD MODE IND [2WD/LOCK/4L]	Control status of 4WD mode indicator lamp is displayed. (LOCK means 4H of 4WD mode)	С
4WD FAIL LAMP [On/Off]	Control status of 4WD warning lamp is displayed.	
ATP IND [On/Off]	Control status of ATP warning lamp is displayed.	DIN
MOTOR DRIVE A [HI/LO/PWM]	Driving status of transfer motor is displayed. (Drive side)	
MOTOR DRIVE B [HI/LO/PWM]	Driving status of transfer motor is displayed. (Reverse side)	
FLUID TEMP SE [V]	This item is not equipped, but displayed.	E
C/U POWER SUP [V]	Power supply voltage value of transfer control unit is displayed.	
MOTOR POWER SUP [V]	Power supply voltage value of transfer motor unit is displayed.	
ROTARY POSITION SENSOR [%]	Transfer rotary position sensor signal is displayed.	F
COMPR VHCL SPEED [km/h]	Vehicle speed calculated by transfer control unit is displayed.	
VHCL/S SEN-FR [km/h]	Wheel speed (front) average calculated by transfer control unit.	G
VHCL/S SEN-RR [km/h]	Wheel speed (rear) average calculated by transfer control unit.	0
ENGINE SPEED SIG [rpm]	Engine status via CAN communication line is displayed.	
		H

WORK SUPPORT

Function	Description	
RPS OFFSET LEARNING VALUE CLEAR	Transfer rotary position sensor learning value is cleared.	

J

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ECU DIAGNOSIS INFORMATION TRANSFER CONTROL UNIT

Reference Value

INFOID:000000012556109

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item		Value/Status	
	4WD shift switch: 4LO	On	
4L SWITCH	4WD shift switch: Excep	t 4LO	Off
	4WD shift switch: 4H		On
	4WD shift switch: Excep	t 4H	Off
	4WD shift switch: 2WD	On	
2WD SWITCH	4WD shift switch: Excep	Off	
		4WD is booting	BOTNG
		4WD mode is switching	SWTNG
4WD MODE	Ignition switch: ON	4WD mode: 2WD	2WD
		4WD mode: 4H	LOCK
		4WD mode: 4LO	4L
	Ignition switch: ON		On
IGN SW	Ignition switch: OFF		Off
	Brake pedal: Depressed	l	On
BRAKE SWITCH	Brake pedal: Released	Off	
	A/T shift selector: D	D	
	A/T shift selector: N	Ν	
SLCT LVR POSI	A/T shift selector: R	R	
	A/T shift selector: P	Р	
	4WD shift switch: Excep	On	
MODE SENSOR	4WD shift switch: 2WD	Off	
	4WD shift switch: 4LO	On	
RANGE SENSOR 2	4WD shift switch: Excep	Off	
	4WD shift switch: 4LO		On
RANGE SENSOR 1	4WD shift switch: Excep	t 4LO	Off
	4WD shift switch: 2WD		2WD
4WD MODE IND	4WD shift switch: 4H		LOCK
	4WD shift switch: 4LO	4L	
	4WD warning lamp: ON		On
	4WD warning lamp: OFI	Off	
	ATP warning lamp: ON		On
ATP IND	ATP warning lamp: OFF	Off	
	When transfer motor is o	driving. (100% duty controlled)	HI
MOTOR DRIVE A	When transfer motor is o	LO	
	When transfer motor is a	PWM	

< ECU DIAGNOSIS INFORMATION >

[TRANSFER: TX91A]

Monitor item	Condition	Value/Status	
	When transfer motor is driving in reversal. (100% duty controlled)	HI	A
MOTOR DRIVE B	When transfer motor is driving or stopping.	LO	
	When transfer motor is driving in reversal. (PWM output)	PWM	В
FLUID TEMP SE	Always	255 V	
C/U POWER SUP	Ignition switch: ON	Battery voltage	
MOTOR POWER SUP	Ignition switch: ON	Battery voltage	С
	4WD mode: 2WD	11 - 14%	
ROTARY POSITION SENSOR	4WD mode: 4H	34 - 44%	DLN
	4WD mode: 4LO	75 - 85%	
COMPR VHCL SPEED	Vehicle driving CAUTION: Check air pressure of tire under standard condition.	Approx. equal to the indication on speedometer (inside of $\pm 10\%$)	E
	Vehicle stopped	0.00 km/h (0.00 mph)	
VHCL/S SEN-FR	Vehicle driving CAUTION: Check air pressure of tire under standard condition.	Approx. equal to the indication on speedometer (inside of $\pm 10\%$)	F
	Vehicle stopped	0.00 km/h (0.00 mph)	G
VHCL/S SEN-RR	Vehicle driving CAUTION: Check air pressure of tire under standard condition.	Approx. equal to the indication on speedometer (inside of $\pm 10\%$)	Н
	Vehicle stopped	0.00 km/h (0.00 mph)	
ENGINE SPEED SIG	Engine: Running	Approx. equal to the indication on tachometer (inside of $\pm 10\%$)	I

TERMINAL LAYOUT



PHYSICAL VALUES

Termiı (Wire	nal No. color)	Description		Condition	Value (Approx.)			Ν
+	-	Signal name	Input/ Output	Condition				
1 (Y/R)	Ground	Power supply (Trans- fer control unit)	Input	Always	Battery voltage	0		
2 (B)	Ground	Ground		Always	0 V	Р		
3 (B)	Ground	Ground	_	Always	0 V			
4 0				lanut	Ignition switch: ON	Battery voltage		
(GR)	Ground	ignition switch	input	Ignition switch: OFF	0 V			

< ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition			
+	-	Signal name	Input/ Output	Condition			
5		Transfer rotary posi-		Ignition switch: ON		5 V	
(L/O)	Ground	tion sensor power supply	Output	Ignition swite	ch: OFF	0 V	
6 (Y)	Ground	Transfer rotary posi- tion sensor (GND)	—		Always	0 V	
9	Ground	Power supply (4WD	Output	Ignition swite	ch: ON	5 V	
(Y/R)	Orband	shift switch)	Output	Ignition swite	ch: OFF	0 V	
10 (G)	Ground	Power supply (Trans- fer motor)	Input		Always	Battery voltage	
11 (L)	Ground	Motor drive A	Output	Transfer mo	tor: Driving	0 V - Battery voltage	
12 (BR)	Ground	Motor drive B	Output	Transfer mo	tor: Driving	0 V - Battery voltage	
13 (L)		CAN-H	Input/ Output	—		_	
14 (P)	_	CAN-L	Input/ Output	_		_	
15 (W/R)	Ground	Rotary position sen- sor input	Input	Ignition switch: ON		400 µ Sec/div	
18	Ground	4WD shift SW (2WD)	Input	Ignition	4WD shift switch: 2WD	5 V	
(G/W)			·	SWITCH: ON	2WD	0 V	
19				lanition	4WD shift switch: 4H	5 V	
(0)	Ground	4WD shift SW (4H)	Input	switch: ON	4WD shift switch: Except 4H	0 V	
20				lanition	4WD shift switch: 4LO	5 V	
(R)	Ground	4WD shift SW (4LO)	Input	switch: ON	4WD shift switch: Except 4LO	0 V	
01				Ignition	4WD shift switch: 4LO	0 V	
(BR)	Ground	Range sensor 2 input	Input	switch: ON	4WD shift switch: 4H	5 V	
					4WD shift switch: 2WD	5 V	
22			Input	Ignition switch: ON	4WD shift switch: 4LO	0 V	
(L/R)	Ground	Range sensor 1 input			4WD shift switch: 4H	5 V	
					4WD shift switch: 2WD	5 V	
23	0	Ground Mode sensor input	Input	Ignition switch: ON	4WD shift switch: 4LO	0 V	
23 (V)	Ground				4vvD sniπ switch: 4H	U V	
					4vvD sniπ switch: 2vvD	5 V	

CAUTION:

When using circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

< ECU DIAGNOSIS INFORMATION >

Fail-Safe

INFOID:000000012556110

А

[TRANSFER: TX91A]

DTC	Vehicle condition	
P1804	No impact to vehicle behavior.	В
P1808	4WD mode cannot be switched by operating 4WD shift switch.	
P1809	4WD mode cannot be switched by operating 4WD shift switch.	0
P180C	4WD mode cannot be switched by operating 4WD shift switch.	C
P180D	4WD mode cannot be switched by operating 4WD shift switch.	
P180F	4WD mode cannot be switched by operating 4WD shift switch.	DLN
P1811	4WD mode cannot be switched by operating 4WD shift switch.	
P1813	When malfunction occurs due to duplicate input, the control continues according to the 4WD mode priority (2WD \rightarrow 4H \rightarrow 4LO). (For malfunction with no input, 4WD mode running at the occurrence of malfunction is maintained.)	Е
P1814	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)	
P1816	4WD mode cannot be switched by operating 4WD shift switch.	F
P1817	4WD mode cannot be switched by operating 4WD shift switch.	
P1818	4WD mode cannot be switched by operating 4WD shift switch.	C
P1819	4WD mode cannot be switched by operating 4WD shift switch.	G
P181B	4WD mode cannot be switched by operating 4WD shift switch.	
P181C	4WD mode cannot be switched by operating 4WD shift switch.	Н
P1820	4WD mode cannot be switched by operating 4WD shift switch.	
P182A	After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)	I
P1855	4WD mode cannot be switched by operating 4WD shift switch.	
P1867	No impact to vehicle behavior.	1
P186C	4WD mode cannot be switched by operating 4WD shift switch.	U
U1000	4H – 4LO switching is prohibited when a malfunction occurs in communications of ECM, TCM, or BCM.	
U1010	4WD mode cannot be switched by operating 4WD shift switch.	K

DTC Inspection Priority Chart

INFOID:000000012556111

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	DTC	Item (CONSULT screen terms)	Reference	M
	P1804	CONTROL UNIT 3	DLN-45, "DTC Description"	
1	P1809	CONTROL UNIT 4	DLN-47, "DTC Description"	Ν
	U1010	CONTROL UNIT (CAN)	DLN-87, "DTC Description"	
	P180C	SEN POWER SUPPLY (5V)	DLN-48, "DTC Description"	0
2	P180F	MOTOR SYSTEM	DLN-54, "DTC Description"	0
2	P1819	SHIFT ACT CIR	DLN-71, "DTC Description"	
	P181C	MOTOR POWER SUPPLY	DLN-76, "DTC Description"	Ρ

< ECU DIAGNOSIS INFORMATION >

Priority	DTC	Item (CONSULT screen terms)	Reference
	P1808	VHCL SPEED SEN-ABS	DLN-46, "DTC Description"
	P180D	ROTARY POSITION SEN	DLN-51, "DTC Description"
	P1811	BATTERY VOLTAGE	DLN-56, "DTC Description"
	P1813	4WD MODE SW	DLN-59, "DTC Description"
2	P1816	T/M RANGE SENSOR A	DLN-65, "DTC Description"
5	P1818	SHIFT ACT POSI SW	DLN-68, "DTC Description"
	P181B	INCOMP SELF SHUT	DLN-73, "DTC Description"
	P1820	ENGINE SPEED	DLN-78, "DTC Description"
	P1855	VHCL SPEED SEN-RR	DLN-82, "DTC Description"
	U1000	CAN COMM CIRCUIT	DLN-86, "DTC Description"
	P1814	4WD DETECT SWITCH	DLN-62, "DTC Description"
	P1817	SHIFT ACTUATOR	DLN-66, "DTC Description"
4	P182A	HI-LO POSITION SEN	DLN-79, "DTC Description"
	P1867	INCOMPLETE SHIFT	DLN-83, "DTC Description"
	P186C	INCOMP RPS OFFSET LEARNING	DLN-85, "DTC Description"

DTC Index

INFOID:000000012556112

X: Turn ON —: Turn OFF

DTC	Display Items	4WD warning lamp	ATP warning lamp	Reference
P1804	CONTROL UNIT 3	—	—	DLN-45, "DTC Description"
P1808	VHCL SPEED SEN-ABS	Х	_	DLN-46, "DTC Description"
P1809	CONTROL UNIT 4	Х	—	DLN-47, "DTC Description"
P180C	SEN POWER SUPPLY (5V)	Х	—	DLN-48, "DTC Description"
P180D	ROTARY POSITION SEN	Х	_	DLN-51, "DTC Description"
P180F	MOTOR SYSTEM	Х	_	DLN-54, "DTC Description"
P1811	BATTERY VOLTAGE	Х	—	DLN-56, "DTC Description"
P1813	4WD MODE SW	Х	—	DLN-59, "DTC Description"
P1814	4WD DETECT SWITCH	Х	—	DLN-62, "DTC Description"
P1816	T/M RANGE SENSOR A	Х	X ^{*1}	DLN-65, "DTC Description"
P1817	SHIFT ACTUATOR	Х	_	DLN-66, "DTC Description"
P1818	SHIFT ACT POSI SW	Х	_	DLN-68, "DTC Description"
P1819	SHIFT ACT CIR	Х	_	DLN-71, "DTC Description"
P181B	INCOMP SELF SHUT	Х	_	DLN-73, "DTC Description"
P181C	MOTOR POWER SUPPLY	Х	—	DLN-76, "DTC Description"
P1820	ENGINE SPEED	Х	—	DLN-78, "DTC Description"
P182A	HI-LO POSITION SEN	Х	Х	DLN-79, "DTC Description"
P1855	VHCL SPEED SEN-RR	Х	—	DLN-82, "DTC Description"
P1867	INCOMPLETE SHIFT	—	X ^{*2}	DLN-83, "DTC Description"
P186C	INCOMP RPS OFFSET LEARNING	X	_	DLN-85, "DTC Description"
U1000	CAN COMM CIRCUIT	Х	_	DLN-86, "DTC Description"
U1010	CONTROL UNIT (CAN)	Х	_	DLN-87, "DTC Description"

*1: When shifted to P position.

*2: When shifted to P position during the occurrence of malfunction between 4H and 4LO.



AADWA0431GB



4WD SYSTEM CONNECTORS - WITH Cummins 5.0L

E26

Connector Name

Connector Color Connector Type Connector No.

E

H.S.

Color of Wire LG/B R/N G/R G/N

Terminal

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AADIA1211GB

TO ENGINE CONTROL NO. 2 HARNESS

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20F

4WD SYSTEM

< WIRING DIAGRAM >

[TRANSFER: TX91A]

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16 12

D/L TO ENGINE ROOM HARNESS	GR TO ENGINE ROOM HARNESS	P I U ENGINE HOUM HARNESS	HW TO ENGINE ROOM HARNESS	AV TO ENGINE POOM HADNESS		2V TO ENGINE POOM LADNESS		1/W I U ENGINE HOUM HARNESS	LG TO ENGINE ROOM HARNESS	R/Y TO ENGINE ROOM HARNESS	IR/Y TO ENGINE ROOM HARNESS	R TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS	BR TO ENGINE ROOM HARNESS	L/R TO ENGINE ROOM HARNESS	/LG TO ENGINE ROOM HARNESS	SB TO ENGINE ROOM HARNESS	W/L TO ENGINE ROOM HARNESS	V/B TO ENGINE ROOM HARNESS	B/Y TO ENGINE ROOM HARNESS	Y TO ENGINE ROOM HARNESS	V/R TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	B TO ENGINE HOUM HAHNESS	V TO ENGINE POOM HARNESS	BG TO ENGINE ROOM HARNESS	L/R TO ENGINE ROOM HARNESS	3/W TO ENGINE ROOM HARNESS	L/B TO ENGINE ROOM HARNESS	L/O TO ENGINE ROOM HARNESS	//W TO ENGINE ROOM HARNESS	R/Y TO ENGINE ROOM HARNESS	3/B TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS	APPLICATION HARNESS	7/B TO ENGINE ROOM HARNESS	L/Y TO ENGINE ROOM HARNESS	O TO ENGINE ROOM HARNESS	W/L TO ENGINE ROOM HARNESS	L TO ENGINE ROOM HARNESS	BR TO ENGINE ROOM HARNESS	HELD TO ENGINE ROOM HARNESS							
6F	7F	* r	10-			195		141	15F	16F F	17F B	18F	19F	20F 1	21F L	22F L	23F	24F V	25F V	26F E	27F	28F V	29F	30F	31F 20E	32F	34F	35F F	36F 1	37F L	38F Y	39F F	40F	41F 40E	43F	44F	45F L	46F	47F V	48F	49F	50F SH	215	22F					
																																 (7))- 						
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HAHNESS	TO MAIN HARNESS	TO MAIN HADNESS		TO MAIN HADNESS		TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		000	502	VIRE TO WIRE	RK26MGY-RS20-X6	iRAY		2F 3F 4F 5F	F 8F 9F 10F 11F	14/11/15/16F 17F 10F 10F 20F 24F	117 101 101 101 101 701 701	- 24F 25F 26F 27F 28F 29F 30F 31F		- 34F 35F 36F 37F 38F 39F 40F 41F	tF 44F 45F 46F 47F	49F 50F 51F 52F			Signal Name	TO ENCINE DOOM HADNEED	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS
~	œ 🕻	P 4	5 3			-		r -	-	_	W/B	B/R	W/B	Ч	-	U	σ	٨/٧	BR	σ	J	>	8	8/M	HB	M/10		- NO	Name	Type	Color G		ų.	6F 71	405 405	171	22F 23F		321 331	42F 43	48F		J[Color of		H/1 a	n ∧a	W/R	B/B
74G	75G	59/	5//	502	000	000	510	928	83G	84G	85G	86G	87G	88G	89G	906	91G	92G	93G	94G	95G	96G	976	989	5001	0001		Connector	Connector	Connector	Connector	E		Н.S.										Terminal	N	1	1	; 4	SF
TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HADNIFES		IO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HAHNESS			TO MAIN HARNESS	TO MAIN PARINESS	TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS
G√	Y/R	G/B	R/W	æ	ГG	G/B	G/B	BR/Y	٩		r 3		GH G	G/H	SB Nar		H	H	, 0	2 0	, a	βV	J	P	æ	M	1	BB	æ	-	× :	s c	5 A	>	BG	BG	BG		s a		W/B	BG	BG	8	Y	-	RW	LW	SHIELD
22G	23G	24G	25G	26G	27G	28G	29G	30G	316	000	324	33G	34G	35G	36G	500	385	396	504	400	436	44G	45G	46G	47G	48G	49G	50G	51G	52G	53G	550	56G	57G	58G	59G	60G	61G	570	646	65G	66G	67G	68G	69G	70G	71G	72G	73G
E152	WIRE TO WIRE	TH80MW-CS16-TM4	WHITE					56 46 36 26 16	100 BG 7G BG		216206196186176166156146136126116	306296286276266256246236226	416406336386376366356346336326316	50G49G47G46G45G45G44G43G42G	61G 60G 59G 58G 57G 56G 55G 54G 53G 52G 51G	7066966866766666666666666666666666	81G80G79G78G77G76G75G74G73G72G71G	9003896896876866856846836826	nec 1040 030 030 91G	200 300 300 300 300 300 300 300 300 300					r of Signal Name		TO MAIN HARNESS	TO MAIN HARNESS	V TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	VK56VD)	CUMMINS 5.0L)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HABNESS	TO MAIN HARNESS	/ TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH CUMMINS 5.0L)	
ctor No.	ctor Name	ctor Tyne	ctor Color				L vi																	-	nal Color		5		BRA	8	•		×	>	σ	œ	>	5/H		A/B	GM	U	G/Y	G√	۲۷ ۲۷	GV.	BY		
une	nne				G		Ē																		Ē	S S	2	2 6	8 9	5 2	66		59	7G	8	98	9		130	146	15G	16G	176	18G	19G	20G	21G	22G	

4WD SYSTEM

4WD SYSTEM CONNECTORS - WITH Cummins 5.0L

Revision: March 2016

2016 Titan NAM

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Revision: March 2016



SENS INPUT	ROUND		SOR (WITH 0L)			
MODE	5	F218	RANGE SEN CUMMINS 5.	RH03FB	BLACK	32
>	8	No.	Name	Type	Color	
1	2	Connector	Connector	Connector	Connector	H.S.

RH04FB

BLACK

Connector Type Connector Color

DLN-32

Signal Name	RANGE 2 SENS INPUT	RANGE 1 SENS INPUT	GROUND	
Color of Wire	BR	L/R	8	
Terminal No.	+	2	e	

Signal Name	MOTOR A	1	1	MOTOR B
Color of Wire	L	ı	-	BR
Terminal No.	-	N	3	4
	-	1		

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2016 Titan NAM

M91	WIRE TO WIRE	TH24FW-NH	WHITE				73 22 21 20 10 18 17 16 15 11 13 23 22 21 20 10 18 17 16 15 11 13	21 L 21 01 11 01 01 01 07 17 77 07			of Signal Name		TO FNORT POON HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE DOOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	I O ENGINE ROOM HARNESS													
Connector No.	Connector Name	Connector Type	Connector Color	E		H.S.	71	1.7			Terminal Color	NO. WIR	- C	2 F/W	4 G/B	- 5 -	9	7 0	8	5 6	10 FG	11 5 5	13 13	14 BR	15 -	16 -	17 W	18 18	20 G.W	21 -	22 -	23	24 0/L													
TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE HOUM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS				NS10EW_CS	WHITE			M 3M MC		MIG MIG MI/ MIG MIG MIG			Signal Name	NOLLINSI		-	1	BATTERY	TAIL LAMP 2	1		IGNITION									
<u>م</u> ۱	æ	-	æ		3	w B/B	>	σ		. 0	۵.	W/N	BR	8	σ	œ (н	<u>م</u>	GR/W		o No	vr Namo	r Time	r Color				r \$	2]		Color of Wire	e e	5 1	'	'	Ŗ	RW			W/B					
78G 79G	80G	81G	82G	83G	84G	998	87G	88G	89G	906	91G	92G	93G	94G	95G	96G	976	506	100G		Choose		Connecto	Connecto			H S					Termina	IN I	2M	ЗM	4M	5M	8M	M)	W6	10M					
TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE HOOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE DOOM HADNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS																			
MR R	P	G/B	G/B	BRY	œ 0	- 5	В	G/R	ß	RW	BR	BR	1	R/G	0	ۍ ا	λH (5 <u>e</u>	3 œ	M		BR	œ	:	× 3	s 0	M	٨	BG	g B B B B B B B B B B B B B B B B B B B	8 0	>	0	٨٨	W/R			~	L	R/W	۲W	SHIELD	≥ □	r B/B	8 98	
25G 26G	27G	28G	29G	30G	316	336	34G	35G	36G	37G	38G	39G	40G	41G	42G	43G	44G	456	47G	48G	49G	50G	51G	52G	53G	24G	56G	57G	58G	59G	616	62G	63G	64G	65G	66G	68G	69G	70G	71G	72G	73G	74G	567 76G	77G	
M31	WIRE TO WIRE	TH80FW-CS16-TM4	WHITE			2	16 26 36 46 00 66 76 86 96 mc	2	116 126 136 146 156 156 176 186 196 206 216	2202302462502602762802300	316326336346356386376386396406416	42G43G44G45G46G45G48G47G48G49G50G	510 520 530 540 550 560 570 580 590 600 610	620 630 640 650 660 670 680 690 700	716/726/736/746/756/766/776/786/796/806/816	82G83G84G85G86G87G88G89G90G	91G 000 000 000	96G 97G 98G 99G 100G				of		TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS -	TO ENGINE ROOM HARNESS -	(WITH VK56VD)	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS
stor No.	ctor Name	ctor Type	stor Color			6																al Color	Wire	σ	B/B	M da	BR	R/W	>	ۍ ۱	∝ ≥	R/G	W/B	B	Y/B	GW G	5 C	⊳ S	٨٨	G√	ΒΛ	G/R	GV		Y/R	G/B
Connec	Connec	Connec	Connec	E		D.H.																Termin	No.	5	2G	ő ő	2 2 2 2 2 3	69	5	88	00 00	110	12G	13G	14G	15G	176	18G	19G	20G	21G	22G	22G		23G	24G

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Revision: March 2016



Signal Name	ILLUMINATION -	1	4WD SHIFT SWITCH 5V SUPPLY	2WD MODE SW	1	4H MODE SW	4L0 MODE SW	ILLUMINATION +	
Color of Wire	GR		Y/R	G/W	1	0	н	-	
Terminal No.	-	N	3	4	5	9	7	8	

DLN-34

AADIA1222GB

2016 Titan NAM

4WD SYSTEM

[TRANSFER: TX91A]



Revision: March 2016

	RE TO WIRE	J8MGY-PR	AY	
Ы	VIF	RSC	GR/	
Connector No.	Connector Name	Connector Type	Connector Color	历刊 H.S.

Signal Name	TO ENGINE CONTROL HARNESS								
Color of Wire	M	-	RW	M	SHIELD	в	BR	æ	
Terminal No.	-	N	e	4	5	9	7	8	

2 8

	E5	WIRE TO WIRE	TH24MW-NH	WHITE	
•	No.	Name	Type	Color	
0	Connector I	Connector I	Connector	Connector (E

DLN-36

H.S.	3 4 5 6 7 8 9 10 11 12	15 16 17 18 19 20 21 22 23 24	Signal Name	TO ENGINE CONTROL HARNESS					
	1 2	13 14	Color of Wire	L/R	BR	٨	٦/0	w	٩
SH			Terminal No.	۲	2	з	4	5	9

	_	_		_		_		_		_			_	_	_
Signal Name	TO ENGINE CONTROL HARNESS														
Color of Wire	L/R	BR	>	Г/0	M	٩	Y/R	BB	WL	Ŋ	SB	-	W/R	>	m
No.	۲	2	e	4	ю	9	7	ø	6	10	11	12	13	14	15
											AA	DI	A11	610	ЗB

2016 Titan NAM

TO MAIN HARNESS

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TO ENGINE CONTROL HARNESS									
8	Y/R	в	B/R	GR	V/R	8	8	٩.	
16	17	18	19	20	21	22	23	24	

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE
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Signal Name	TO MAIN HARNESS																						
Color of Wire	LG/B	R/W	Y/R	G/R	G/W	٩	0	œ	σ	ГG	BB	GR	σ	BB	ı	1	×	ı	Y/R	G/W	1	1	1
Terminal No.	-	2	e	4	s	9	7	8	6	10	F	12	13	14	15	16	17	18	19	20	21	22	23

Connector No.	E142	
Connector Name	TRANSFER CONTROL UNIT	
Connector Type	TH20FW-TB6	
Connector Color	WHITE	
EB		
		E
ю.Е		_
12	¹⁰ 9 8 7 6 5 4 ³ ² ¹	
26 25 24	23 22 21 20 7 19 18 17 16 15 14 13	

	Signal Name	ECU POWER	GND	GND	IGN SW	ROTARY POSITION SENSOR 5V SUPPLY	ROTARY POSITION SENSOR RETURN	T	1	4WD SHIFT SWITCH 5V SUPPLY	MOTOR POWER	MOTOR A	MOTOR B	CAN-H	CAN-L	ROTARY POSITION SENSOR INPUT	T	I	2WD MODE SW	4H MODE SW	4LO MODE SW	RANGE 2 SENSOR INPUT	RANGE 1 SENSOR INPUT	MODE SENSOR INPUT	I	1																									
An under	Wire	Y/R	в	m	GR	Г/0	٨	ı	ı	Y/R	ß	L	BR	L	Р	W/R	I	I	G/W	0	ш	BR	L/R	٨	-	1																									
Terminel	No.	-	2	e	4	ŝ	9	7	80	6	10	11	12	13	14	15	16	17	18	19	20	21	22	33	24	25																									
F14	WIRE TO WIRE	TH24FW-NH	WHITE				10 0 0 7 6 6 1 2 2 1	10 3 0 / 0 3 4 3 2 1 1 22 21 20 10 18 17 16 15 14 13					Signal Name	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	I U ENGINE KOUM HAHNESS															
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No.	Name V	Tvpe	Color				10 11	12 12	3 4			Color of	Wire	ВЛ	В	>	2	>	•	Υ/R	B	WL	5	SB	-	W/R	>		n 5	H)	B/B	GR	٨/R	SHIELD	SHIELD	2															
Connector	Connector	Connector	Connector	9	LEVEN		0.1					Terminal	No.	-	2	e	4	5	9	2	60	6	10	ŧ	12	13	14	15	91 1	2 G	19	20	21	22	23	24															
TO MAIN HARNESS		TO MAIN HAPPIESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HABNESS	TO MAIN HADNESS	TO MAIN HARNESS		I O MAIN HARNESS	TO MAIN HAHNESS	TO MAIN HARNESS		TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HADNESS	TO MAIN HARNESS				KIGE SENSON (WITH KEEVD)	HORE HORE	LACK			R	1 0 2				Signal Name	5	RANGE 2 SENSOR INPUT		GHOOND												
≥ 0	r g	2	, ≥		~	_	œ	_	-	W/R			8//R	<u>م</u> .		5 (IJ	M/	В	σ	σ	> (ч		GRW					Tune I	Color B							-	Color of	Wire	BB -	5 0	n								
74G	50/	50/	78G	79G	80G	81G	82G	83G	84G	856	500	500	8/6	886	596	500	916	92G	93G	94G	95G	96G	976	000	1006		Connector	Connector	CONTRACTOR	Connector	Connector			SH					Terminal	No.		4 6	"								
TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS			
GΛ	Y/R	G/B	R/W	в	ГG	G/B	G/B	BR/Y	٩	٩	٨L	GR	G/R	ß	R/W	BB	H		B/G	0		RY	σ	ГG	в	w	'	BB	<u> </u>	- 3	* *	σ	N	7	B	g d	<u>г</u> п		œ	ML	W/R	ß	BG		- -	, MA	N	SHIELD			
22G	23G	24G	25G	26G	27G	28G	29G	30G	31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	416	42G	436	44G	45G	46G	47G	48G	49G	50G	51G	52G	54G	55G	56G	57G	58G	59G	616	62G	63G	64G	65G	66G	67G	686	5002	71G	72G	73G			
152	IRE TO WIRE	H80MW-CS16-TM4	(HITE					5G 46 36 26 16	106 96 86 76 66	201120120150150150150150	200 290 280 270 280 250 240 230 220		400 390 380 370 380 350 340 330 320 310 500 480 480 480 480 440 430 430	07100101101101101101101101	800 59G 58G 57G 58G 55G 54G 53G 52G 51G 700 6602 680 670 660 650 640 630 630		806 796 776 776 766 756 746 736 726 716	9003836 886 876 886 856 856 856 846 836 826	85G 94G 93G 92G 91G	1006 996 976 966					Signal Name	TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	TO MAIN HARNESS - WITH	CUMMINS 5.0L)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	CUMMINS 5.0L)			
No.	Name W	Tvpe	Color							1010	2		410	- [616	- [816								Color of		P B/B	W/B	BR/W	BR	٩	WA		>	σ .	r 3	R/G	W/B	BR	Y/B	GM	σ	G∑	41	δγ	ΒΛ	G/R				
ctor I	ector I	ector	lector (ú	ò																		ninal o			2 9	g	g	g	g	,	g	g (5 2	5	g	gg	4G	5G	5	7G	5 2	2 8	1G	2G				



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< WIRING DIAGRAM >



Terminal No.	Color of Wire	Signal Name
-	W/R	RPS INPUT
2	2	RPS +5V
8	۶	RPS GROUND
Connector	No.	-27
Connector	Name -	FRANSFER MOTOR (WITH

TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS

RW RW BR BR BR

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Signal Name

Color of Wire

≥

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F32 WIRE TO WIRE RS08FGY-PR GRAY

tor No. F27	tor Name TRANSFER VK56VD)	tor Type RH04FB	tor Color BLACK	
Connect	Connect	Connect	Connect	E

Signal Name	MOTOR A	Т	1	MOTOR B
Color of Wire	L	ı	-	BR
Terminal No.	F	2	3	4

AADIA1163GB

F40	MODE SENSOR (WITH VK56VD)	RH02FB	BLACK	
Connector No.	Connector Name	Connector Type	Connector Color	대 H.S.
				4

1 2 3

5	Signal Name	MODE SENSOR INPLIT
	Color of Wire	^
	Terminal No.	

GROUND

M91	WIRE TO WIRE	TH24FW-NH	WHITE				2 11 10 9 8 7 6 5 4 3 2 1	4 23 22 21 20 19 18 17 16 15 14 13	-		-	r of Signal Name	ø	V TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE HOUM HAHNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS														
Connector No.	Connector Name	Connector Type	Connector Color	J	NHH N	ЗН	12	1				Terminal Color	NO.	1 GM	2 G	Н/Х	4 C	9	0 2	8	5 6	10 FG	11 BR	12 GR	14	15	- 16	17 W		19 Y/R	20 6/W	23	1 23	24 O/L														
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79G	508	816	82G	83G	84G	85G	86G	87G	88G	89G	90G	91G	92G	93G	94G	95G	996	97G	586 086	1006			Connect	Connect	Connect	Connect			0				Termina	No	Ā 1	3W	M4	5M	6M	₩ź	8M	W6	10M					
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25G 26G	276	286	29G	30G	31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	41G	42G	43G	44G	45G	47G	48G	49G	50G	51G	52G	53G	54G	566	57G	58G	59G	60G	61G	636	64G	65G	66G	676	684	69G 70G	/00	726	236	74G	75G	76G	77G	
M31	e WIRE TO WIRE	TH80FW-CS16-TM4	r WHITE				1G 2G 3G 4G 5G	66 76 86 96 106		11G 12G 13G 14G 15G 16G 17G 18G 19G 20G 21G	226236246256266276286296306	31G32G33G34G35G38G37G38G39G40G41G	4264364464564664764864366506	5101520153015401550156015701580159001610	620630640850660670880690700	71G72G73G74G75G76G77G77G78G129G80G81G	82G83C84G85G86G87C88G89C90C		3 19 92/G 93/G 94/G 95/G				ar of	ire Signal Name	3 TO ENGINE ROOM HARNESS	/R TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS		W TO ENGINE ROOM HARNESS	Y TO ENGINE ROOM HARNESS	3 TO ENGINE ROOM HARNESS	R TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS	VG TO ENGINE POOM HARNESS	R TO ENGINE ROOM HARNESS	/B TO ENGINE ROOM HARNESS	W TO ENGINE ROOM HARNESS	G TO ENGINE ROOM HARNESS	D TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS		TO ENGINE ROOM HARNESS	(WITH CUMMINS 5.0L)	7 TO ENGINE ROOM HARNESS -	(WITH WARDOW)	(B TO ENGINE ROOM HARNESS	-
ector No.	ector Name	nector Type	nector Color	1		Ľ	5][ninal Colo	lo. Mi	G	G B/	2 S	5 C	9 8 9 8	- 0	0	90	> 2	9L	36	14G Y/	5G G/	9 99	7G (98	96	5 0		5 	2G G	36 VI	46	-



< WIRING DIAGRAM >

2016 Titan NAM

[TRANSFER: TX91A]

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Revision: March 2016



Signal Name	ILLUMINATION -	I	4WD SHIFT SWITCH 5V SUPPLY	2WD MODE SW	1	4H MODE SW	4LO MODE SW	ILLUMINATION +	
Color of Wire	GR		Y/R	G/W	-	0	н	٢	
Terminal No.	-	2	3	4	5	9	7	8	

DLN-40

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2016 Titan NAM

< BASIC INSPECTION >

BASIC INSPECTION DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing <u>DLN-42</u>, "<u>Diagnostic</u> <u>Work Sheet</u>" and reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary.

Customers are not professional. Never guess easily like "maybe the customer means that...," or "maybe the customer mentions this symptom".

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe function. Refer to <u>DLN-27, "Fail-Safe"</u>.

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

With CONSULT Perform self-diagnosis for "ALL MODE AWD/4WD". <u>Is any DTC detected?</u> YES >> Record or print self-diagnosis results. GO TO 4. NO >> GO TO 6. 4.RECHECK SYMPTOM With CONSULT

1. Erase self-diagnostic results for "ALL MODE AWD/4WD".

2. Perform DTC confirmation procedures for the error detected system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on <u>DLN-</u> M 27, "DTC Inspection Priority Chart".

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-43</u>, <u>"Intermittent Incident"</u>.

5.REPAIR OR REPLACE ERROR-DETECTED PARTS

Repair or replace error-detected parts.

• Reconnect part or connector after repairing or replacing.

When DTC is detected, erase self-diagnostic results for "ALL MODE AWD/4WD".

>> GO TO 7.

O.IDENTIFY ERROR-DETECTED SYSTEM BY SYMPTOM DIAGNOSIS

Estimate error-detected system based on symptom diagnosis and perform inspection. Can the error-detected system be identified?

INFOID:000000012556114

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-43</u>, <u>"Intermittent Incident"</u>.

7.FINAL CHECK

With CONSULT

- 1. Check the reference value for "ALL MODE AWD/4WD".
- 2. Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:000000012556115

Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

Interview sheet sample

			Interview s	heet				
Customer	MR/MS	Registration number			Initial year reg- istration			
name		Vehicle type			VIN			
Storage date		Engine			Mileage		km (Mile)
		□Vehicle does	ot enter 4WD r	node.				
		□4WD warning	lamp turns on.					
Symptom		□Heavy tight-co	rner braking sy	mptom occur	S			
- ,		□Noise □V	bration					
		□Others ()	
First occurre	ence	□Recently	Others ()	
Frequency of	of occurrence	□Always □	Jnder a certain	conditions of	□Sometimes	(time(s)/day	')	
		□Irrelevant						
Climate	Weather	□Fine □Clo	ud ⊡Rain	□Snow	□Others ()	
conditions	Temperature	□Hot □Wa	m □Cool	□Cold	□Temperature [App	orox.	°C () 0°	°F)]
	Relative humidity	□High □Mo	derate □Lo	W				
Road condit	tions	□Urban area □Mounting road	□Suburb area (uphill or dowr	a ⊡High n hill) ⊡Re	way ough road			
Operation c	onditions, etc.	□Irrelevant □When engine □During driving □During decele	starts ⊡Dur ⊡During a ration ⊡Dur	ring idling cceleration ring cornering	□At constant spe g (right curve or left o	ed driving curve)		

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[TRANSFER: TX91A]

			Interview sheet			
Customer	MR/MS	Registration number		Initial year reg- istration		
name		Vehicle type		VIN		
Storage date		Engine		Mileage	km (Mile)
Other condi	tions					(
Memo						D
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TRANSFER ROTARY POSITION SENSOR LEARNING VALUE INITIALIZATION [TRANSFER: TX91A]

< BASIC INSPECTION >

TRANSFER ROTARY POSITION SENSOR LEARNING VALUE INITIALIZA-TION

Description

INFOID:000000012556116

After replacing the following parts, transfer rotary position sensor learning value stored in the transfer control unit must be erased.

- Transfer assembly
- Transfer rotary position sensor

For how to erase the learning value, refer to DLN-44, "Work Procedure".

Work Procedure

INFOID:000000012556117

1.ERASE TRANSFER ROTARY POSITION SENSOR LEARNING VALUE

(B) With CONSULT

- 1. Select "WORK SUPPORT" in "ALL MODE AWD/4WD".
- 2. Perform "RPS OFFSET LEARNING VALUE CLEAR" to the CONSULT display.

>> WORK END

DTC/CIRCUIT DIAGNOSIS P1804 TRANSFER CONTROL UNIT

DTC Description

DTC DETECTION LOGIC

Malfunction is detected in the memory (EEPROM) system of transfer control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	
		Diagnosis condition	Ignition switch: ON	DLN
		Signal	-	
P1804	(Control unit 3)	Threshold	Malfunction is detected in the memory (EEPROM) system of transfer control unit.	Е
		Diagnosis delay time	_	
POSSIBLE C Transfer contr	CAUSE rol unit			F
FAIL-SAFE	vehicle behavior.			G
DTC CONFII 1.precone	RMATION PROCEDURE	E		Н

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

(P) With CONSULT Turn the ignition switch OFF to ON. Κ Perform self-diagnosis for "ALL MODE AWD/4WD". 2. Is DTC "P1804" detected? >> Proceed to diagnosis procedure. Refer to DLN-45, "Diagnosis Procedure". YES L NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-2 >> Confirmation after repair: INSPECTION END Diagnosis Procedure INFOID:000000012556119 Μ **1.**PERFORM SELF-DIAGNOSIS (P) With CONSULT Ν 1. Erase self-diagnostic results for "ALL MODE AWD/4WD". Turn the ignition switch OFF, and then wait 10 seconds and more. 2. Perform self-diagnosis for "ALL MODE AWD/4WD". 3. Ο Is DTC "P1804" detected?

- YES >> Replace transfer control unit. Refer to <u>DLN-100, "Removal and Installation"</u>.
- NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector. P If any items are damaged, repair or replace error-detected parts.

INFOID:000000012556118

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P1808 VEHICLE SPEED SENSOR (ABS)

< DTC/CIRCUIT DIAGNOSIS >

P1808 VEHICLE SPEED SENSOR (ABS)

DTC Description

INFOID:000000012556120

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
		Diagnosis condition	Vehicle speed: 30 km/h (19 MPH) or more
		Signal	Vehicle speed signal
P1808	VHCL SPEED SEN-ABS (Vehicle speed sensor-ABS)	Threshold	Malfunction is detected in vehicle speed signal that is out- put from ABS actuator and electric unit (control unit) through CAN communication.
		Diagnosis delay time	20 seconds or more

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- ABS actuator and electric unit (control unit)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

- 1. Start the engine.
- 2. Drive vehicle and maintain the following conditions for 20 seconds or more.

Vehicle speed : 30 km/h (19 MPH) or more

3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1808" detected?

YES >> Proceed to diagnosis procedure. Refer to <u>DLN-46, "Diagnosis Procedure"</u>.

- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556121

1.CHECK DTC OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

With CONSULT

- 1. Turn the ignition switch ON.
- Perform self-diagnosis for "ABS".

Is any DTCs detected?

- YES >> Check DTC detected item. Refer to <u>BRC-55, "DTC Index"</u>.
- NO >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P1809 TRANSFER CONTROL UNIT

DTC Description

DTC DETECTION LOGIC

AD converter system of transfer control unit is malfunctioning.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	С
		Diagnosis condition	Ignition switch: ON	
		Signal	_	DLN
P1809 (Control uni	(Control unit 4)	Threshold	AD converter system of transfer control unit is malfunction- ing.	
		Diagnosis delay time	_	E
POSSIBLE C Transfer contro FAIL-SAFE 4WD mode ca	AUSE ol unit nnot be switched by opera	tina 4WD shift switc	h.	F
DTC CONFIE	MATION PROCEDURE			G
1.PRECOND	ITIONING	-		
If "DTC CONF wait at least 10	IRMATION PROCEDURE') seconds before conducti	' has been previousl ng the next test.	y conducted, always turn ignition switch OFF and	Н
>> G(O TO 2.			
2.DTC REPR	ODUCTION PROCEDUR	E		

With CONSULT		J
1. Turn the ignition switch OFF to ON.		
2. Perform self-diagnosis for "ALL MODE AWD/4WD".		
Is DTC "P1809" detected?		K
YES >> Proceed to diagnosis procedure. Refer to <u>DLN-47, "Diagnosis Procedure"</u> .		
NO-2 >> Confirmation after repair: INSPECTION END	1	L
Diagnosis Procedure	INFOID:000000013494841	
1.PERFORM SELF-DIAGNOSIS		M
(I) With CONSULT		
1. Erase self-diagnostic results for "ALL MODE AWD/4WD".		
2. Turn the ignition switch OFF, and then wait 10 seconds and more.		N

- Turn the ignition switch OFF, and then wait 10 seconds and more. 2.
- Perform self-diagnosis for "ALL MODE AWD/4WD". 3.

Is DTC "P1809" detected?

YES >> Replace transfer control unit. Refer to DLN-100, "Removal and Installation".

NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace error-detected parts.

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INFOID:000000013494840

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P180C SENSOR POWER SUPPLY (5V)

DTC Description

INFOID:000000012556122

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in 5V power supply circuit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
	P180C SEN POWER SUPPLY (5V) [Sensor power supply (5V)]	Diagnosis condition	Ignition switch: ON	
D190C		Signal	—	
FIGUE		Threshold	Malfunction is detected in 5V power supply circuit	
		Diagnosis delay time	—	

POSSIBLE CAUSE

• Transfer rotary position sensor 5V power supply circuit

4WD shift switch 5V power supply circuit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

() With CONSULT

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P180C" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-48, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556123

1. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Connect transfer rotary position sensor harness connector.
- 3. Turn the ignition switch ON.

CAUTION: Never start the engine.

4. Check the voltage between transfer rotary position sensor harness connector and ground.

Transfer rotary	position sensor		Voltage	
Connector Terminal		_	voltage	
F219 (Cummins 5.0L)	2	Ground		
F18 (VK56VD)	Z	Ground	Applox. 5 V	

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 2.

10 77 00 10 2.

P180C SENSOR POWER SUPPLY (5V)

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

$\overline{2.}$ CHECK TRANSFER ROTARY POSITION SENSOR CIRCUIT А 1. Turn the ignition switch OFF. Disconnect transfer control unit harness connector. 2. Check the continuity between transfer control unit harness connector and transfer rotary position sensor 3. В harness connector. Transfer control unit Transfer rotary position sensor Continuity Connector Terminal Connector Terminal F219 (Cummins 5.0L) E142 5 2 Existed DLN F18 (VK56VD) Check the continuity between transfer rotary position sensor harness connector and ground. Е Transfer rotary position sensor Continuity Connector Terminal F219 (Cummins 5.0L) 2 Ground Not existed F18 (VK56VD) Is the inspection result normal? YES >> GO TO 3. NO >> Repair or replace error-detected parts. ${\it 3.}$ Check 4WD shift switch power supply Н 1. Turn the ignition switch OFF. 2. Connect 4WD shift switch harness connector. Turn the ignition switch ON. 3. CAUTION: Never start the engine. Check the voltage between 4WD shift switch harness connector and ground. 4 4WD shift switch Voltage Connector Terminal Κ M141 3 Ground Approx. 5 V Is the inspection result normal? YES >> INSPECTION END NO >> GO TO 4. 4.CHECK 4WD SHIFT SWITCH CIRCUIT M 1. Turn the ignition switch OFF. 2. Disconnect transfer control unit harness connector. 3. Check the continuity between transfer control unit harness connector and 4WD shift switch harness connector. Ν Transfer control unit 4WD shift switch Continuity Connector Terminal Connector Terminal 9 M141 3 F142 Existed Check the continuity between 4WD shift switch harness connector and ground. Ρ 4WD shift switch Continuity

 Connector
 Terminal

 M141
 3
 Ground
 Not existed

 Is the inspection result normal?
 Is the inspection result normal?
 Is the inspection result normal?

YES >> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

P180D TRANSFER ROTARY POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P180D TRANSFER ROTARY POSITION SENSOR

DTC Description

DTC DETECTION LOGIC

Deviation exists between actual angle detected by transfer rotary position sensor and the one recognized by transfer control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	C
-		Diagnosis condition	Ignition switch: ON	DLN
		Signal	_	
P180D	ROTARY POSITION SEN (Rotary position sensor)	Threshold	Deviation exists between actual angle detected by transfer rotary position sensor and the one recognized by transfer control unit	E
		Diagnosis delay time	_	
POSSIBLE C • Transfer rota • Transfer con NOTE: The transfer r assembly or transfer r	AUSE iry position sensor trol unit otary position sensor lear ansfer rotary position sens	ming value may be	left unerased after the replacement of transfer	F
FAIL-SAFE 4WD mode ca	nnot be switched by opera	ting 4WD shift switc	h.	Η
DTC CONFIF	RMATION PROCEDURE			1
1.PRECOND	ITIONING			I
If "DTC CONF wait at least 10	IRMATION PROCEDURE') seconds before conduction	' has been previousl ng the next test.	y conducted, always turn ignition switch OFF and	J
>> G(O TO 2.			IZ.
2.DTC REPR	ODUCTION PROCEDURI	E		K
 With CONS Turn the ig Perform se Is DTC "P180E 	SULT gnition switch ON. elf-diagnosis for "ALL MOE D" detected?	DE AWD/4WD".		L
YES >> Pr NO-1 >> To NO-2 >> Co	oceed to diagnosis proced ocheck malfunction sympto onfirmation after repair: INS	lure. Refer to <u>DLN-5</u> om before repair: Re SPECTION END	<u>1, "Diagnosis Procedure"</u> . fer to <u>GI-43, "Intermittent Incident"</u> .	Μ
Diagnosis F	Procedure		INFOID:000000012556125	Ν
1.CHECK TR	ANSFER ROTARY POSIT	ION SENSOR SIGN	JAL	
 Turn the ig Check the 	gnition switch ON. voltage between transfer	control unit harness	connector and ground.	O

[TRANSFER: TX91A]

INFOID:000000012556124

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P180D TRANSFER ROTARY POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

+ Transfer control unit		_	Voltage
Connector	Terminal		
E142	15	Ground	400 µ Sec/div

- 3. Start the engine.
- On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".
- 5. Check that the "ROTARY POSITION SENSOR" value.

Monitor Item	Condition	Value
ROTARY POSITION SENSOR	4WD mode: 2WD	11 – 14%
	4WD mode: 4H	34 – 44%
	4WD mode: 4LO	75 – 85%

Is the inspection result normal?

YES >> Replace transfer control unit. Refer to <u>DLN-100, "Removal and Installation"</u>.

NO >> GO TO 2.

2. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer rotary position sensor harness connector.
- 3. Turn the ignition switch ON.

CAUTION: Never start the engine.

4. Check the voltage between transfer rotary position sensor harness connector terminals.

-	F	-	
Т	Voltage		
Connector	Terr		
F219 (with Cummins 5.0L)	2	2	
F18 (with VK56VD)	2	5	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 4. NO >> GO TO 3.

NO >> GO 10 3.

3.CHECK TRANSFER ROTARY POSITION SENSOR CIRCUIT

1. Turn the ignition switch OFF.

2. Disconnect transfer control unit harness connector.

 Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

P180D TRANSFER ROTARY POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

A	Continuity	Transfer rotary position sensor		control unit	Transfer c
	Continuity	Terminal	Connector	Terminal	Connector
B		2	F219 (with Cummins 5.0L)	5	
D	Evictod	3		6	E142
	Existed	2		E 142 5	
С	+	3		6	

4. Check the continuity between transfer rotary position sensor harness connector and ground.

Transfer rotary position sensor			Continuity	DLN									
Connector	Terminal	_	Continuity										
F219 (with Cummins 5.0L)	2			E									
	3	Cround	Cround	Cround	Cround	Cround	Cround	Cround	Cround	Cround	Cround	Cround	Net evieted
F18 (with VK56VD)	2	Ground	Not existed										
	3			F									
In the state of the second second	10		·										

Is the inspection result normal?

YES >> Replace transfer rotary position sensor. Refer to <u>DLN-106, "Removal and Installation"</u>.

NO >> Repair or replace error-detected parts.

4. CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Check the continuity between transfer control unit harness connector and transfer rotary position sensor harness connector.

Transfer control unit		Transfer rotary position sensor		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
E142	15	F219 (with Cummins 5.0L)	1	Eviated	
∈ 142	15	F18 (with VK56VD)		EXISTER	

4. Check the continuity between transfer rotary position sensor harness connector and ground.

Transfer rotary position sensor			Continuity	L
Connector	Terminal		Continuity	
F219 (with Cummins 5.0L)	1	Cround	Not existed	
F18 (with VK56VD)	I	Gibulia	NOL EXISTED	N

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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P180F MOTOR SYSTEM

DTC Description

INFOID:000000012556126

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in transfer motor system.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
	MOTOR SYSTEM	Diagnosis condition	When all of the following conditions are satisfied:Engine runningTransfer motor driving	
P180F	(Motor system)	Signal	Motor drive (terminal #11 and #12)	
		Threshold	Malfunction is detected in transfer motor system.	
		Diagnosis delay time	_	

POSSIBLE CAUSE

- Transfer control unit
- Transfer motor
- Harness or connectors (Transfer motor circuit are open or shorted)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

- 1. Turn the ignition switch OFF.
- 2. Start the engine.
- 3. Turn the 4WD shift switch $2WD \rightarrow 4H \rightarrow 4LO$. CAUTION:

Hold the 4WD shift switch at each position for 5 seconds or more.

4. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P180F" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-54, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556127

1.CHECK TRANSFER MOTOR CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Disconnect transfer motor harness connector.
- 4. Check continuity between transfer control unit harness connector and transfer motor harness connector.

P180F MOTOR SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Connector Terminal Connector Terminal Continuity 11 F221 (with Cummins 1 1 Existed 12 F27 (with VK56VD) 1 Existed 5. Check the continuity between transfer motor harness connector and the ground. Transfer motor Terminal - Continuity 6. Connector Terminal - Continuity 5. Check the continuity between transfer motor harness connector and the ground. - Continuity 5. Check the continuity between transfer motor harness connector and the ground. - Continuity F221 (with Cummins 5.0L) 1 - Continuity F221 (with VK56VD) 4 Ground Not existed sthe inspection result normal? YES S GO TO 2. NO > Replace the transfer control unit. Refer to DLN-100. "Removal and Installation". NO > Replace the transfer motor. Refer to DLN-107. "Removal and Installation". NO > Replace the transfer motor. Refer to DLN-107. "Removal and Installation". NO > Resistance - - -<	Transfer	control unit		Transfe	er motor	2	
E142 11 F221 (with Cummins) 1 4 Existed 11 F27 (with VK56VD) 1 4 Existed 3. Check the continuity between transfer motor harness connector and the ground. Image: Connector Teaminal - Continuity F221 (with Cummins 5.0L) 1 - Continuity F221 (with Cummins 5.0L) 4 Ground Not existed F221 (with VK56VD) 1 - Continuity F221 (with VK56VD) 4 Ground Not existed F221 (with VK56VD) 4 - Continuity s.the inspection result normal? XES > GO TO 2. NO >> Replar or replace error-detected parts. 2.CHECK TRANSFER MOTOR - DLN-107. "Removal and Installation". NO >> Replace the transfer control unit. Refer to DLN-100. "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107. "Removal and Installation". NO >> concentered transfer motor terminals. Image: Check the resistance between transfer motor terminals. - - - - Image: Check the resistance between transfer motor terminals. - - - -	Connector	Terminal	Conne	ector	Terminal	Continuit	У
E142 12 5.0L) 4 Existed 11 F27 (with VK56VD) 1 4 Connector Transfer motor - Continuity F221 (with Cummins 5.0L) 1 - Continuity F221 (with Cummins 5.0L) 1 - Continuity F221 (with Cummins 5.0L) 1 - Continuity F221 (with VK56VD) 1 - Continuity F221 (with VK56VD) 4 Ground Not existed F221 (with VK56VD) 4 - Continuity F221 (with VK56VD) 1 - Continuity F23 Sela control onnal? - Context control onnal? YES > Replace the transfer control unit. Refer to DLN-100. "Removal and Installation". Context control onnal?		11	F221 (with	Cummins	1		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	E140	12	5.01	5.0L)			
12 12/(With VkS0U) 4 5. Check the continuity between transfer motor harness connector and the ground. Transfer motor Connector Terminal F221 (with Cummins 5.0L) 1 F221 (with Cummins 5.0L) 1 Ground Not existed F221 (with VK56VD) 1 Ground Not existed F27 (with VK56VD) 1 Sthe inspection result normal? YES > GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55. "Component Inspection". s.the inspection result normal? YES >> Replace the transfer motor. Refer to DLN-100. "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107. "Removal and Installation". Component Inspection wrononnecesser 1. CHECK TRANSFER MOTOR Image: State and the stallation and the stallation". 2. Check the resistance between transfer motor terminals. Image: State and the stallation". YES > Inspection result normal? YES > INSPECTION END NO >> Replace transfer motor. Ref	E142	11				Existed	
5. Check the continuity between transfer motor harness connector and the ground. Transfer motor Terminal Connector Terminal F221 (with Cummins 5.0L) 4 Ground Not existed F221 (with VK56VD) 1 Ground Not existed F27 (with VK56VD) 1 Ground Not existed F27 (with VK56VD) 4 Ground Not existed F28 >> Replace the transfer motor. Refer to DLN-55, "Component Inspection". S the inspection result normal? YES YES >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". Component Inspection weaseeccourse and the existence Transfer motor Resistance Transfer motor Resistance Terminal 0.25 - 0.3 Ω s. the inspection result normal? YES >> INSPECTION END NO >> Rep		12		/KOOVD)	4		
Transfer motor Continuity Connector Terminal F221 (with Cummins 5.0L) 1 4 Ground F27 (with VK56VD) 1 4 Ground Not existed F27 (with VK56VD) 4 Sthe inspection result normal? YES > GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55. "Component Inspection". sthe inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100. "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107. "Removal and Installation". Component Inspection ************************************	5. Check the conti	nuity between tran	sfer motor ha	rness co	nnector and the	e ground.	
Connector Terminal Connector F221 (with Cummins 5.0L) 1 1 F27 (with VK56VD) 1 0 s the inspection result normal? YES > GO TO 2. NO >> Repair or replace error-detected parts. 2. 2. CHECK TRANSFER MOTOR 2. Check the transfer motor. Refer to DLN-55. "Component Inspection". S the inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100. "Removal and Installation". NO >> Replace the transfer control unit. Refer to DLN-107. "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107. "Removal and Installation". Component Inspection Accesseconseconseconseconseconseconsecons		Transfer motor				Continuity	
F221 (with Cummins 5.0L) 1 Ground Not existed F27 (with VK56VD) 1 Ground Not existed s the inspection result normal? YES > GO TO 2. NO NO >> Repair or replace error-detected parts. 2. CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55, "Component Inspection". s the inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". Component Inspection wear.coccccccccccccccccccccccccccccccccccc	Connector	Tern	ninal		—	Continuity	
121 (with VK56VD) 4 Ground Not existed F27 (with VK56VD) 1 Ground Not existed s.the inspection result normal? YES > GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55, "Component Inspection". s.the inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". NO Component Inspection service consecutor result Note existence 1.CHECK TRANSFER MOTOR . . 1. Remove transfer motor. Refer to DLN-107, "Removal and Installation". . 2. Check the resistance between transfer motor terminals. . Transfer motor Resistance 1 4 0.25 - 0.3 Ω s.the inspection result normal? . YES > INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation". NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation".	E221 (with Cummins)	5.01.)	1				
F27 (with VK56VD) 1 Indexisted sthe inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2. CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55, "Component Inspection". sthe inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". Component Inspection Arrowson 1 Check the resistance between transfer motor terminals. Transfer motor Resistance 1 4 0.25 - 0.3 \Omega s.the inspection result normal? YES YES >> INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation". 2. Check the resistance between transfer motor terminals. Transfer motor Terminal Resistance 1 4 0.25 - 0.3 \Omega s.the inspection result normal? YES YES >> INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation". <td></td> <td>2.0L)</td> <td>4</td> <td></td> <td>Ground</td> <td>Not existed</td> <td></td>		2.0L)	4		Ground	Not existed	
4 s the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55, "Component Inspection". s the inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". Component Inspection	F27 (with \/K56\/C))	1		Ground	NUL EXISTED	
s the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. 2.CHECK TRANSFER MOTOR Check the transfer motor. Refer to DLN-55. "Component Inspection". s the inspection result normal? YES >> Replace the transfer control unit. Refer to DLN-100. "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107. "Removal and Installation". Component Inspection 1. CHECK TRANSFER MOTOR 1. Remove transfer motor. Refer to DLN-107. "Removal and Installation". 2. Check the resistance between transfer motor terminals. Transfer motor Terminal 1 4 0.25 - 0.3 Ω s the inspection result normal? YES >> INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation".			4				
Component Inspection NPFOID 200000001255612. 1. CHECK TRANSFER MOTOR 1. Remove transfer motor. Refer to DLN-107. "Removal and Installation". 2. Check the resistance between transfer motor terminals. Transfer motor Resistance 1 4 0.25 - 0.3 Ω s the inspection result normal? YES > INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation".	YES >> Replace	e the transfer contr e the transfer moto	rol unit. Refer or. Refer to <u>DL</u>	to <u>DLN-1</u> <u>N-107, "I</u>	00, "Removal a Removal and In	and Installation". Istallation".	
1. CHECK TRANSFER MOTOR 1. Remove transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u> . 2. Check the resistance between transfer motor terminals. Image: Transfer motor Terminal 1 4 0.25 - 0.3 Ω s the inspection result normal? YES YES NO >> Replace transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u> .	Component Ins	pection					INFOID:00000001255612
1. Remove transfer motor. Refer to DLN-107, "Removal and Installation". 2. Check the resistance between transfer motor terminals. Transfer motor Resistance Terminal 1 4 0.25 - 0.3 Ω s the inspection result normal? YES >> INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation".	1 .CHECK TRANSP	ER MOTOR					
Transfer motorResistanceTerminal0.25 - 0.3 Ω140.25 - 0.3 Ωs the inspection result normal?YES>> INSPECTION ENDNO>> Replace transfer motor. Refer to DLN-107, "Removal and Installation".	 Remove transfer Check the resist 	er motor. Refer to <u>[</u> tance between trai	<u>DLN-107, "Rer</u> nsfer motor te	<u>moval an</u> rminals.	<u>d Installation"</u> .		
Terminal Resistance 1 4 0.25 – 0.3 Ω s the inspection result normal? YES >> INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation".	Tranef	er motor					
140.25 - 0.3 Ωs the inspection result normal?YES>> INSPECTION ENDNO>> Replace transfer motor. Refer to DLN-107, "Removal and Installation".	Ter	minal	Resis	stance			
s the inspection result normal? YES >> INSPECTION END NO >> Replace transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u> .	1	4	0.25 -	- 0.3 Ω			
YES >> INSPECTION END NO >> Replace transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u> .	s the inspection res	sult normal?	I		_		
NO >> Replace transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u> .	YES >> INSPEC	CTION END					
	NO >> Replace	e transfer motor. R	efer to <u>DLN-1</u>	07, "Rem	oval and Instal	lation".	

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P1811 BATTERY VOLTAGE

DTC Description

INFOID:000000012556129

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in transfer control unit power supply circuit when the engine is ON.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
		Diagnosis condition	Engine running	
		Signal	—	
P1811	(Battery voltage)	ThresholdMalfunction is detected in transfer control unit power s ply circuit when the engine is ON.		
			2 seconds or more	

POSSIBLE CAUSE

Harness or connector (transfer control unit power supply circuit is open or shorted)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- 1. Start the engine and wait for 2 seconds or more.
- 2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1811" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-56, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556130

1.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Check the voltage between transfer control unit harness connector and ground.

Transfer o	Transfer control unit		Voltage
Connector	Connector Terminal		voltage
E142	1	Ground	Battery voltage

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between transfer control unit harness connector and ground.

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

	control unit		Voltage		\sim
Connector	Terminal		voltage		
E142	1	Ground	Battery voltage		В
Is the inspectio	n result normal	<u>?</u>			
YES >> GO NO >> GO 2. CHECK TR/) TO 3.) TO 2. ANSFER CONT	ROL UNIT PO	WER SUPPLY (2)	С
 Turn the ig Check the Check the fuse box. 	nition switch OF 10A fuse (#59). harness for op	F. en or short bef	ween transfer co	ntrol unit harness connector No.1 te	DL erminal and
Is the inspectio	n result normal	<u>?</u>			E
YES >> Pe	rform the troub	le diagnosis fo	r power supply o	ircuit. Refer to <u>PG-13, "Wiring Diag</u>	<u>ram - BAT-</u>
NO >> Re	RY POWER SU	<u>JPPLY - WITH</u>	Cummins 5.0L -'		-
			ранз. м/со енорну <i>(</i>		F
			WER SUPPLY (\$)	
 1. Turn the ig 2. Check the 	voltage betwee	-F. n transfer cont	rol unit harness c	onnector and ground.	G
Transfor	control unit				
Connector	Terminal		Voltage		H
Connector E142 3. Turn the ig	Terminal 4 nition switch Of	Ground	Voltage Approx. 0 V		H
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the	Terminal 4 nition switch Of t the engine. voltage betwee	Ground N. n transfer cont	Voltage Approx. 0 V rol unit harness o	onnector and ground.	H I J
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of	Terminal 4 nition switch Of t the engine. voltage betwee	Ground N. n transfer cont	Voltage Approx. 0 V rol unit harness c	onnector and ground.	H I J
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector	Terminal 4 nition switch ON t the engine. voltage betwee control unit Terminal	Ground N. n transfer cont	Voltage Approx. 0 V rol unit harness o Voltage	onnector and ground.	J
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4	Ground N. n transfer cont	Voltage Approx. 0 V rol unit harness c Voltage Battery voltage	onnector and ground.	H J K
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer Connector E142 Is the inspectio	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4 n result normal	Ground N. n transfer cont Ground Ground	Voltage Approx. 0 V rol unit harness o Voltage Battery voltage	onnector and ground.	H J K
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142 Is the inspectio YES >> GC NO >> GC	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4 n result normal 0 TO 5. 0 TO 4.	Ground N. n transfer cont Ground Ground	Voltage Approx. 0 V rol unit harness o Voltage Battery voltage	onnector and ground.	H J K
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142 Is the inspectio YES >> GC NO >> GC 4.CHECK TR/	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4 n result normal 7 TO 5. TO 5. TO 4. ANSFER CONT	Ground N. n transfer cont Ground Ground ?	Voltage Approx. 0 V rol unit harness c Voltage Battery voltage WER SUPPLY (4	onnector and ground.	F J L
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142 Is the inspectio YES $>>$ GC NO $>>$ GC A.CHECK TR/ 1. Turn the ig 2. Check the 3. Disconnect 4. Check the nector.	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4 n result normal 0 TO 5. 0 TO 4. ANSFER CONT nition switch Of 10A fuse (#30). t fuse block (J/E continuity betw	Ground N. n transfer cont Ground Ground Cround Crou	Voltage Approx. 0 V rol unit harness o Voltage Battery voltage WER SUPPLY (4 nector. ontrol unit harnes	onnector and ground.) ss connector and fuse block (J/B) ha	F J J K L M arness con-
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142 Is the inspection YES $>>$ GC NO $>>$ GC 4. CHECK TR/ 1. Turn the ig 2. Check the 3. Disconneci 4. Check the nector.	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4 n result normal 0 TO 5. 0 TO 4. ANSFER CONT nition switch OF 10A fuse (#30). t fuse block (J/E continuity betw	Ground N. n transfer cont Ground Ground ? TROL UNIT PO FF. 3) harness cont een transfer co	Voltage Approx. 0 V rol unit harness o Voltage Battery voltage WER SUPPLY (hector. ontrol unit harnes	onnector and ground.) ss connector and fuse block (J/B) ha	I J K L M arness con-
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142 Is the inspection YES $>>$ GC NO $>>$ GC A.CHECK TR/ 1. Turn the ig 2. Check the 3. Disconnector 4. Check the nector. Fuse bil	Terminal 4 nition switch Of t the engine. voltage betwee control unit Terminal 4 n result normal 0 TO 5. 0 TO 4. ANSFER CONT nition switch OF 10A fuse (#30). t fuse block (J/E continuity betw	Ground Ground I. In transfer cont Ground Ground Connector Transfer Connector	Voltage Approx. 0 V rol unit harness o Voltage Battery voltage WER SUPPLY (4 nector. ontrol unit harnes control unit harnes	onnector and ground.) as connector and fuse block (J/B) ha	I J K L M arness con-
Connector E142 3. Turn the ig CAUTION: Never star 4. Check the Transfer of Connector E142 Is the inspectio YES >> GC NO >> GC 4.CHECK TR/ 1. Turn the ig 2. Check the 3. Disconnect 4. Check the nector. Fuse bl Connector	Terminal 4 nition switch Of t the engine. voltage betwee control unit 4 n result normal 4 n result normal 0 TO 5. 0 TO 4. ANSFER CONT nition switch OF 10A fuse (#30). t fuse block (J/E continuity betw ock (J/B) Terminal 1M	Ground N. n transfer cont Ground Ground Cround Crou	Voltage Approx. 0 V rol unit harness o Voltage Battery voltage WER SUPPLY (A nector. ontrol unit harnes control unit Terminal	onnector and ground.	I J K L M arness con-

Transfer o	control unit		Continuity
Connector	Terminal		Continuity
E142	4	Ground	Not existed

P1811 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-71, "Wiring Diagram -</u> <u>IGNITION POWER SUPPLY - WITH Cummins 5.0L -"</u>.

NO >> Repair or replace error-detected parts.

5. CHECK TRANSFER CONTROL UNIT GROUND

1. Turn the ignition switch OFF.

2. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage
Connector	Terminal		voltage
F1/2	2	Ground	
	3	Oround	

3. Check the continuity between transfer control unit harness connector and ground.

Transfer control unit			Continuity
Connector	Terminal		Continuity
E142	E142 2		Existed
L 142	3	Ground	LAISIEU

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

< DTC/CIRCUIT DIAGNOSIS >

P1813 4WD MODE SWITCH

DTC Description

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В

F

INFOID:000000012556131

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Multiple signals received from 4WD shift switch are detected.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		С
		Diagnosis condition	When all of the following conditions are satisfied:Engine running4WD shift switch is switched	DLN
P1813	4WD MODE SW	Signal	4WD shift switch (terminal #18, #19 and #20)	
	(4WD mode switch)	Threshold	Multiple signals received from 4WD shift switch are detected.	Е
		Diagnosis delay time	1 seconds or more	

POSSIBLE CAUSE

• 4WD shift switch

· Transfer control unit

FAIL-SAFE	G
When malfunction occurs due to duplicate input, the control continues according to the 4WD mode priority (2WD \rightarrow 4H \rightarrow 4LO). (For malfunction with no input, 4WD mode running at the occurrence of malfunction is maintained.)	Н
DTC CONFIRMATION PROCEDURE	
1.preconditioning	
If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.	
>> GO TO 2.	J
2.DTC REPRODUCTION PROCEDURE	K
With CONSULT	1.
 Turn the ignition switch OFF. Start the engine. Turn the 4WD shift switch 2WD → 4H → 4LO. 	L
Hold the 4WD shift switch at each position for 1 seconds or more. 4. Perform self-diagnosis for "ALL MODE AWD/4WD".	M
Is DTC "P1813" detected?	
 YES >> Proceed to diagnosis procedure. Refer to <u>DLN-59, "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>. NO-2 >> Confirmation after repair: INSPECTION END 	Ν
Diagnosis Procedure	0
1.CHECK 4WD SHIFT SWITCH	
Check 4WD shift switch. Refer to <u>DLN-60, "Component Inspection"</u> .	Ρ
Is the inspection result normal?	
YES >> GO TO 2. NO >> Replace 4WD shift switch Refer to DI N-101 "Removal and Installation"	
2. CHECK 4WD SHIFT SWITCH CIRCUIT (1)	

1. Disconnect transfer control unit harness connector.

P1813 4WD MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

2. Check the continuity between transfer control unit harness connector and 4WD shift switch harness connector.

Transfer o	control unit	4WD sh	ift switch	Continuity
Connector	Terminal	Connector	Terminal	Continuity
			3	Not existed
	10		4	Existed
	10		6	Not existed
			7	Not existed
		M141	3	Not existed
E142	10		4	Not existed
L 142	19		6	Existed
			7	Not existed
			3	Not existed
20	20		4	Not existed
		6	Not existed	
			7	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK 4WD SHIFT SWITCH CIRCUIT (2)

Check the continuity between 4WD shift switch harness connector and ground.

4WD sh	ift switch		Continuity	
Connector	Connector Terminal		Continuity	
	4			
M141	6	Ground	Not existed	
	7			

Is the inspection result normal?

YES >> Replace transfer control unit. Refer to <u>DLN-100, "Removal and Installation"</u>.

NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK 4WD SHIFT SWITCH

1. Turn the ignition switch OFF.

2. Remove 4WD shift switch. Refer to <u>DLN-101, "Removal and Installation"</u>.

3. Check the continuity between 4WD shift switch harness connector terminals.

4WD shift switch		Condition	Continuity	
len	Tillia			
3	1	4WD shift switch: 2WD	Existed	
5		4WD shift switch: 4H or 4LO	Not existed	
2	6	4WD shift switch: 4H	Existed	
5	0	4WD shift switch: 2WD or 4LO	Not existed	
3	7	4WD shift switch: 4LO	Existed	
5	/	4WD shift switch: 2WD or 4H	Not existed	

Is the inspection result normal?

INFOID:000000012556133

P1813 4WD MODE SWITCH

[TRANSFER:	TX91A]
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< DTC/	C/CIRCUIT DIAGNOSIS > [TRANSFER: TX91A]		
YES	>> INSPECTION END		
NU	-> Replace 400D shint switch. Relet to <u>DEN-101, Removal and Installation</u> .		

< DTC/CIRCUIT DIAGNOSIS >

P1814 4WD DETECT SWITCH

DTC Description

INFOID:000000012556134

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Mode sensor detects 2WD despite 4WD recognized by transfer rotary position sensor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
P1814	4WD DETECT SWITCH (4WD detect switch)	Diagnosis condition	When all of the following conditions are satisfied:Ignition switch: ONVehicle: 4H or 4LO	
		Signal	Mode sensor input (terminal #23)	
		Threshold	Mode sensor detects 2WD despite 4WD recognized by transfer rotary position sensor.	
		Diagnosis delay time	5 seconds or more	

POSSIBLE CAUSE

Mode sensor

· Harness or connector (Mode sensor circuit is open or shorted)

FAIL-SAFE

After a malfunction is confirmed, 4WD mode can be switchable. (4WD mode temporarily not switchable only during diagnosis)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

() With CONSULT

- 1. Turn the ignition switch OFF to ON.
- 2. Set the vehicle to 4WD and wait for 5 seconds or more.
- 3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1814" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-62, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556135

1.CHECK MODE SENSOR SIGNAL

- 1. Turn the ignition switch ON.
- 2. Check the voltage between transfer control unit harness connector and ground.

Transfer control unit			Condition	Voltage
Connector	Terminal		Condition	voltage
			4WD shift switch: 2WD	Approx. 5 V
E142	23	Ground	4WD shift switch: 4H	Approx. 0 V
			4WD shift switch: 4LO	Approx. 0 V

Is any DTCs detected?

YES >> INSPECTION END

P1814 4WD DETECT SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

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NO >> GO TO 2.

2. CHECK MODE SENSOR CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Disconnect mode sensor harness connector.
- Check the continuity between transfer control unit harness connector and mode sensor harness connector.

	Transfer control unit		Mode sensor	Continuity	
	Connector	Terminal	Connector	Terminal	Continuity
	E142	22	F217 (with Cummins 5.0L)	1	Eviated
	E142	23	F40 (with VK56V)	I	Existed
5. Check the continuity between mode sensor harness connector and ground.					

Mode sensor		Continuity		
Connector	Terminal		Continuity	
F217 (with Cummins 5.0L)	1	Ground	Not existed	
F40 (with VK56VD)	1	Ground	NOT EXISTED	

Is inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK MODE SENSOR GROUND

Check the continuity between mode sensor harness connector and ground.

Mode sensor			•	
Connector	Terminal		Continuity	
F217 (with Cummins 5.0L)	2	Ground	Existed	
F40 (with VK56VD)	2	Ground	Existed	
Is the inspection result norm	al?			
NO >> Repair or replac 4.CHECK MODE SENSOR	e error-detecte	ed parts.		
Check the mode sensor. Re	fer to <u>DLN-63,</u>	"Component Ir	nspection".	
Is the inspection result norm	<u>al?</u>			
YES >> INSPECTION E NO >> Repair mode se	ND nsor. Refer to	<u>DLN-108, "Rer</u>	noval and Instal	ation".
Component Increation	_			

Component Inspection

1.CHECK MODE SENSOR

1. Turn the ignition switch OFF.

2. Remove mode sensor. Refer to <u>DLN-108, "Removal and Installation"</u>.

3. Check the continuity between mode sensor harness connector terminals.

Mode sensor Terminal		Condition	Continuity
		Condition	Continuity
1 2 -		While pushing switch of mode sensor.	Existed
		Other than the above.	Not existed

Is the inspection result normal?



INFOID:000000012556136

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P1814 4WD DETECT SWITCH

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

NO >> Replace mode sensor. Refer to <u>DLN-108, "Removal and Installation"</u>.

P1816 TRANSMISSION RANGE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P1816 TRANSMISSION RANGE SWITCH

DTC Description

[TRANSFER: TX91A]

INFOID:000000012556137

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DTC DETECTION LOGIC

Malfunction is detected in shift position signal that is output from TCM through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	С	
		Diagnosis condition	 When all of the following conditions are satisfied: Ignition switch: ON A/T shift selector is operated 	DL	
P1816 (Tr A)	(Transmission range sensor	Signal	Shift position signal		
	A)	Threshold	Malfunction is detected in shift position signal that is output from TCM through CAN communication.	E	
		Diagnosis delay time	-		
POSSIBLE C, • Harness or c • TCM • A/T shift sele	AUSE onnector (CAN communic ctor	ation line)		F	
FAIL-SAFE 4WD mode car	not be switched by opera	ting 4WD shift switc	h.	Н	
1. precondi	TIONING	-			
If "DTC CONFI wait at least 10	RMATION PROCEDURE' seconds before conduction	' has been previousl ng the next test.	y conducted, always turn ignition switch OFF and		
>> GO TO 2.					
2.DTC REPR	ODUCTION PROCEDURI	E			
	ULT			K	
 Turn the ig Shift the A 	nition switch OFF to ON. /T shift selector in P positi	on			
3. Perform se	elf-diagnosis for "ALL MOE	DE AWD/4WD".		L	
<u>Is DTC "P1816</u>	<u>" detected?</u>				
NO-1 >> To NO-2 >> Co	check malfunction sympto nfirmation after repair: IN	om before repair: Re SPECTION END	efer to <u>GI-43, "Intermittent Incident"</u> .	N	
Diagnosis F	Procedure		INFOID:000000012556138		
1.снеск ртс об тсм					
 With CONS 1. Turn the ig 2. Perform set 	B ULT nition switch ON. If-diagnosis for "TRANSM	IISSION".		С	
<u>Is any DTCs de</u> YES >> Ch NO >> IN	<u>etected?</u> leck the DTC. Refer to <u>TM</u> SPECTION END	I-68, "DTC Index" (F	RE6R01A) or <u>TM-333, "DTC Index"</u> (RE7R01B).	Ρ	

P1817 TRANSFER MOTOR

INFOID:000000012556139

DTC DETECTION LOGIC

Malfunction is detected in transfer motor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
P1817	SHIFT ACTUATOR (Shift actuator)	Diagnosis condition	When all of the following conditions are satisfied:Engine runningTransfer motor driving	
		Signal	_	
		Threshold	Malfunction is detected in transfer motor.	
		Diagnosis delay time	5 seconds or more	

POSSIBLE CAUSE

- Transfer motor
- Transfer assembly

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

() With CONSULT

- 1. Turn the ignition switch OFF.
- 2. Start the engine.
- 3. Turn the 4WD shift switch $2WD \rightarrow 4H \rightarrow 4LO$. CAUTION:

Hold the 4WD shift switch at each position for 5 seconds or more.

4. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1817" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-66, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556140

1.CHECK TRANSFER MOTOR (1)

- 1. Turn the ignition switch OFF.
- 2. Remove the transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u>.
- 3. Visually check transfer motor gear for damage.

Is the inspection result normal?

YES >> GO TO 2.

- NO >> Replace the transfer motor. Refer to <u>DLN-107, "Removal and Installation"</u>.
- 2. CHECK TRANSFER MOTOR (2)

Check the transfer motor. Refer to <u>DLN-67, "Component Inspection"</u>.

Is the inspection result normal?

P1817 TRANSFER MOTOR

[TRANSFER: TX91A] < DTC/CIRCUIT DIAGNOSIS > YES >> Replace the transfer assembly. Refer to DLN-116, "Removal and Installation". NO >> Replace the transfer motor. Refer to DLN-107, "Removal and Installation". А **Component Inspection** INFOID:000000012556141 1.CHECK TRANSFER MOTOR В Remove transfer motor. Refer to DLN-107, "Removal and Installation". 1. 2. Check the resistance between transfer motor terminals. С Transfer motor Resistance Terminal DLN 0.25 – 0.3 Ω 1 4 Is the inspection result normal? Ε YES >> INSPECTION END NO >> Replace transfer motor. Refer to DLN-107, "Removal and Installation". F Н Κ L Μ Ν Ο Ρ

< DTC/CIRCUIT DIAGNOSIS >

P1818 ACTUATOR POSITION SWITCH

DTC Description

INFOID:000000012556142

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in signal from transfer rotary position sensor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
		Diagnosis condition	Ignition switch: ON	
P1818	SHIFT ACT POSI SW (Shift actuator position switch)	Signal	_	
		Threshold	Malfunction is detected in signal from transfer rotary position sensor.	
		Diagnosis delay time	_	

POSSIBLE CAUSE

· Transfer rotary position sensor

• Harness or connector (Transfer rotary position sensor circuit is open or shorted)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

(I) With CONSULT

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1818" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-68, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556143

1. CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer rotary position sensor harness connector.
- 3. Turn the ignition switch ON. CAUTION:

Never start the engine.

4. Check the voltage between transfer rotary position sensor harness connector and ground.

+				
Transfer rotary position sensor		_	Voltage (Approx.)	
Connector	Terminal	*	(FF -)	
F219 (with Cummins 5.0L)	2	Ground	5 V	
F18 (with VK56VD)	Σ			

Is the inspection result normal?

YES >> GO TO 3.

P1818 ACTUATOR POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

>> GO TO 2.

NO

[TRANSFER: TX91A]

2.CHECK TRANSFER ROTARY POSITION SENSOR POWER SUPPLY CIRCUIT А 1. Turn the ignition switch OFF. Disconnect transfer control unit harness connector. 2. В Check the continuity between transfer control unit harness connector and transfer rotary position sensor 3. harness connector. + Transfer control unit Continuity Transfer rotary position sensor Connector Terminal Connector Terminal DLN F219 (with Cummins 5.0L) E142 5 2 Existed F18 (with VK56VD) E 4. Check harness for short to ground and short to power. Is the inspection result normal? YES >> Perform trouble diagnosis for transfer control unit power supply circuit. Refer to DLN-88, "Diagnosis Procedure". NO >> Repair or replace error-detected parts. ${f 3.}$ CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL CIRCUIT 1. Turn the ignition switch OFF. Disconnect transfer control unit harness connector. 2. Check the continuity between transfer control unit harness connector and transfer rotary position sensor 3. Н harness connector. + Transfer control unit Transfer rotary position sensor Continuity Connector Terminal Connector Terminal 3 6 F219 (Cummins 5.0L) 15 1 E142 Fxisted 6 3 F18 (VK56VD) Κ 15 1 Check harness for short to ground and short to power. Is the inspection result normal? YES >> GO TO 4. NO >> Repair or replace error-detected parts. ${f 4}$. CHECK TRANSFER ROTARY POSITION SENSOR SIGNAL M (P)With CONSULT Reconnect all harness connectors disconnected. 1. Ν 2. Turn ignition switch ON. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION 3. SENSOR". Ο Is the indicated value "100%"? YES >> GO TO 5. NO >> GO TO 7. Ρ **5.**CHECK RANGE SENSOR STATUS With CONSULT Turn ignition switch ON. 1 On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "RANGE SENSOR 1" 2. and "RANGE SENSOR 2". Check the value of "RANGE SENSOR 1" and "RANGE SENSOR 2". 3.

Do "RANGE SENSOR 1" and "RANGE SENSOR 2" display "ON"?

DLN-69

P1818 ACTUATOR POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 6. NO >> GO TO 7.

6.check actuator shaft actuation

()With CONSULT

- 1. Turn ignition switch OFF.
- 2. Remove transfer motor. Refer to <u>DLN-107</u>, "Removal and Installation".
- 3. Connect transfer motor connector.
- 4. Turn ignition switch ON.
- 5. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".
- 6. Rotate the actuator shaft clockwise until status below.

ROTARY POSITION SENSOR : 75% – 85%

- 7. Turn ignition switch OFF.
- 8. Install transfer motor.

NOTE:

When installing transfer motor, if there is misalignment between transfer motor axis and actuator shaft, rotate the transfer motor axis by hand.

- 9. Start the engine.
- 10. On CONSULT screen, select "ALL MODE AWD/4WD" >> "DATA MONITOR" >> "ROTARY POSITION SENSOR".
- 11. Check that the "ROTARY POSITION SENSOR" value.

Monitor Item	Condition	Value
ROTARY POSITION SENSOR	4WD mode: 2WD	11 – 14%
	4WD mode: 4H	34 – 44%
	4WD mode: 4LO	75 – 85%

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

I.REPLACE TRANSFER ROTARY POSITION SENSOR

Replace transfer rotary position sensor. Refer to <u>DLN-106</u>, "Removal and Installation".

>> INSPECTION END

< DTC/CIRCUIT DIAGNOSIS >

P1819 ACTUATOR CIRCUIT

DTC Description

[TRANSFER: TX91A]

INFOID:000000012556144

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DTC DETECTION LOGIC

Malfunction is detected in transfer motor circuit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		С
P1819 SHIFT ACT CIR (Shift actuator circuit)	Diagnosis condition	Ignition switch: ON		
	Signal		DLN	
	Threshold	Malfunction is detected in transfer motor circuit.		
		Diagnosis delay time		_
				- E

POSSIBLE CAUSE

Harness or connectors (Transfer motor circuit is open or shorted.)

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2. 2.DTC REPRODUCTION PROCEDURE	I
 With CONSULT Turn ignition switch ON. 	J
2. Perform self-diagnosis for "ALL MODE AWD/4WD".	
Is DTC "P1819" detected?	k
 YES >> Proceed to diagnosis procedure. Refer to <u>DLN-71, "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>. 	
NO-2 >> Confirmation after repair: INSPECTION END	

INFOID:000000012556145

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1. CHECK TRANSFER MOTOR CIRCUIT

1. Turn ignition switch OFF.

Diagnosis Procedure

- 2. Disconnect transfer control unit harness connector and transfer motor harness connector.
- Check the continuity between transfer control unit harness connector and transfer motor harness connector.

	+	-		
Transfer of	control unit	Transfer motor		Continuity
Connector	Terminal	Connector	Terminal	
	11	F221 (Cummins 5.0L)	1	
E142	12		4	Existed
⊏142	11	F27 (VK56VD)	1	
	12		4	

4. Check harness for short to power, short to ground, and short to each circuit. Is the inspection result normal?

Revision: March 2016

DLN-71

< DTC/CIRCUIT DIAGNOSIS >

- YES >> INSPECTION END
- NO >> Repair or replace error-detected parts.
< DTC/CIRCUIT DIAGNOSIS >

P181B INCOMPLETE SELFSHUT

DTC Description

[TRANSFER: TX91A]

INFOID:000000012556146

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DTC DETECTION LOGIC

After ignition switch OFF, transfer control unit cannot perform self-shut.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition	С
		Diagnosis condition	Ignition switch: ON	
		Signal	_	DLN
P181B	(Incomplete self-shut)	Threshold	After ignition switch OFF, transfer control unit cannot per- form self-shut.	
		Diagnosis delay time	_	Е
NOTE: If battery termitrol unit.	inal is removed before trar	nsfer control unit sto	p, DTC P181B may be detected by transfer con-	F
POSSIBLE CTransfer conHarness or cBattery performance	AUSE trol unit connector (transfer control ormance degradation	unit power supply ci	rcuit is open or shorted)	G
FAIL-SAFE 4WD mode ca	nnot be switched by opera	ting 4WD shift switc	h.	Η
DTC CONFIF	RMATION PROCEDURE			
1.PRECOND	ITIONING			
If "DTC CONF wait at least 10	IRMATION PROCEDURE') seconds before conduction	has been previously ng the next test.	y conducted, always turn ignition switch OFF and	J
>> G(O TO 2			
2.DTC REPR	ODUCTION PROCEDUR	=		K
		_		
1. Turn the ig	gnition switch ON.			
2. Turn the ig	nition switch OFF and wai	it for 2 seconds or m	ore.	L
4. Perform s	gnition switch ON. elf-diagnosis for "ALL MOE	DE AWD/4WD".		
Is DTC "P181E	<u>3" detected?</u>			M
YES >> Pr	oceed to diagnosis proced	lure. Refer to <u>DLN-7</u>	3, "Diagnosis Procedure". fer to GL43, "Intermittent Incident"	
NO-2 >> Co	onfirmation after repair: INS	SPECTION END	ier to <u>OF-45, internittent incident</u> .	N
Diagnosis F	Procedure		INFOID:000000012556147	1.4
4				
I.CHECK BA	TTERY PERFORMANCE			0
Check state of	charge and any condition	for battery. Refer to	PG-164, "Work Flow".	
Is the inspection	on result normal?			Ρ
YES >> G(NO >> R	O TO 2.	Refer to PG-176	Removal and Installation - CUMMINS 5.01 "	
2.CHECK TR	ANSFER CONTROL UNIT	POWER SUPPLY	(1)	
1. Turn the ig	gnition switch OFF.			

2. Disconnect transfer control unit harness connector.

3. Check the voltage between transfer control unit harness connector and ground.

P181B INCOMPLETE SELFSHUT

< DTC/CIRCUIT DIAGNOSIS >

Transfer o	control unit		Voltage
Connector	Terminal		voltage
E142	1	Ground	Battery voltage

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage
Connector	Terminal		voltage
E142	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (2)

1. Turn the ignition switch OFF.

- 2. Check the 10A fuse (#59).
- 3. Check the harness for open or short between transfer control unit harness connector No.1 terminal and fuse box.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>PG-13</u>, "Wiring Diagram <u>BAT-</u> <u>TERY POWER SUPPLY - WITH Cummins 5.0L -"</u>.
- NO >> Repair or replace error-detected parts.

4.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (3)

- 1. Turn the ignition switch OFF.
- 2. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage	
Connector	Terminal		voltage	
E142	4	Ground	Approx. 0 V	

3. Turn the ignition switch ON.

CAUTION:

Never start the engine.

4. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage	
Connector	Terminal		voltage	
E142	4	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (4)

1. Turn the ignition switch OFF.

2. Check the 10A fuse (#30).

3. Disconnect fuse block (J/B) harness connector.

 Check the continuity between transfer control unit harness connector and fuse block (J/B) harness connector.

P181B INCOMPLETE SELFSHUT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Fuse bl	ock (J/B)	Transfer	control unit	Continuity	
Connector	Terminal	Connector	Terminal		
M69	1M	E142	4	Existed	
6. Check the	continuity betwo	een transfer cor	ntrol unit harnes	s connector and	the ground.
				_	
Transfer of	control unit		Continuity	-	
Connector	Terminal		Continuity		
E142	4	Ground	Not existed	-	
s the inspectio	n result normal	?		-	
YES >> Pe	rform the troubl	e diagnosis for	ignition power	supply circuit. Re	efer to <u>PG-71,</u>
	NITION POWER	<u>R SUPPLY - WI</u> arrar datacted r	<u>TH Cummins 5</u>	<u>.0L -"</u> .	
J.CHECK TRA	ANSFER CONT	RUL UNIT GR	JUND		
1. Turn the ig	nition switch Of	=F. n transfor contr	al unit harnood	connector and a	round
2. Check the	vollage betwee			connector and y	ound.
Transfer	control unit			-	
Connector	Terminal		Voltage		
	2			-	
E142	3	Ground	Approx. 0 V		
2 Chock the	oontinuity botw	oon transfor oor	trol unit harnor		around
5. Check the					ground.
Transfer	control unit			-	
Connector	Terminal		Continuity		
	2			-	
E142	3	Ground	Existed		
la tha in an actio		2		-	
	n result normal	<u>fer control unit</u>	Refer to DI N-1	00 "Removal an	d Installation'
NO >> Re	pair or replace	error-detected p	parts.		
		·			

P181C TRANSFER MOTOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

P181C TRANSFER MOTOR POWER SUPPLY

DTC Description

INFOID:000000012556148

[TRANSFER: TX91A]

DTC DETECTION LOGIC

When starting the engine, abnormality is detected in power source of transfer motor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
P181C	MOTOR POWER SUPPLY (Motor power supply)	Diagnosis condition	Engine running	
		Signal	Power supply (Transfer motor) (terminal #10)	
		Threshold	When starting the engine, abnormality is detected in power source of transfer motor.	
		Diagnosis delay time	2 seconds or more	

POSSIBLE CAUSE

Malfunction of transfer control actuator (transfer motor) power supply circuit

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

With CONSULT

- 1. Start the engine and wait for 2 seconds or more.
- 2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P181C" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-76, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556149

1.CHECK TRANSFER MOTOR POWER SUPPLY

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage	
Connector	Terminal		voltage	
E142	10	Ground	Battery voltage	

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between transfer control unit harness connector and ground.

P181C TRANSFER MOTOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

Transfer co	ontrol unit	_	Voltage		
Connector	Terminal	—	voltage		
E142	10	Ground	Battery voltage		
the inspection	result normal?				
'ES >> INS IO >> GO	PECTION END				
DETECT MA		G ITEM			
neck the follow	vina.				_
Harness for sh	ort or open bet	ween battery	positive termina	and transfer control unit harness connector te	er-
ninal 10. Refe Batterv	er to <u>PG-13, "Wi</u>	ring Diagram	- BATTERY PO	VER SUPPLY - WITH Cummins 5.0L -".	
BOA fusible lin	k CUMMINS 5.0	DL (#Q) or VK	56VD (#O). Refe	r to PG-155. "Terminal Arrangement".	
the inspection	result normal?				
ES >> INS IO >> Rep	PECTION END air or replace e	rror-detected	parts.		

P1820 ENGINE SPEED SIGNAL

DTC Description

INFOID:000000012556150

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in engine speed signal that is output from ECM through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
P1820	ENGINE SPEED SIG (Engine speed signal)	Diagnosis condition	Engine running and vehicle running	
		Signal	Engine speed signal	
		Threshold	Malfunction is detected in engine speed signal that is out- put from ECM through CAN communication.	
		Diagnosis delay time	30 seconds or more	

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- ECM

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

() With CONSULT

- 1. Start the engine.
- 2. Drive vehicle and maintain the following conditions for 30 seconds or more.

Vehicle speed : More than 20 km/h (12 MPH)

3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1820" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-78, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556151

1.CHECK DTC OF ECM

() With CONSULT

- 1. Turn the ignition switch ON.
- 2. Perform self-diagnosis for "ENGINE".

Is any DTCs detected?

- YES >> Check DTC detected item. Refer to <u>EC-135. "DTC Index"</u> (CUMMINS 5.0L) or <u>EC-1366. "DTC Index"</u> (VK56VD).
- NO >> INSPECTION END

P182A TRANSFER HI-LO POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

P182A TRANSFER HI-LO POSITION SENSOR

DTC Description

DTC DETECTION LOGIC

When deviated from position pattern of range sensor.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
P182A	HI-LO POSITION SEN (High-low position sensor)	Diagnosis condition	 When all of the following conditions are satisfied: Ignition switch: ON 4WD shift switch is switched between 4H and 4LO. 	DLN
		Signal	Range sensor input (terminal #21 and #22)	
		Threshold	When deviated from position pattern of range sensor.	Е
		Diagnosis delay time	5 seconds or more	
POSSIBLE C Range sense Harness or c 	AUSE or connector (Range sensor c	ircuit is open or sho	rted)	F
FAIL-SAFE After a malfun during diagnos	ction is confirmed, 4WD n sis)	node can be switcha	able. (4WD mode temporarily not switchable only	G

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2. 2.DTC REPRODUCTION PROCEDURE	L	ļ
 With CONSULT Turn the ignition switch OFF. Start the engine 	K	~ \
 3. Turn the 4WD shift switch 2WD → 4H → 4LO. CAUTION: Hold the 4WD shift switch at each position for 5 seconds or more. 4. Perform self-diagnosis for "ALL MODE AWD/4WD". 	L	-
Is DTC "P182A" detected?	N	/
 YES >> Proceed to diagnosis procedure. Refer to <u>DLN-79, "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u> NO-2 >> Confirmation after repair: INSPECTION END 	<u>"</u> .	1
Diagnosis Procedure	INFOID:000000012556153	
1.CHECK RANGE SENSOR SIGNAL	С)

2. Check the voltage between transfer control unit harness connector and ground.

[TRANSFER: TX91A]

INFOID:000000012556152

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P182A TRANSFER HI-LO POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Transfer control unit			Condition	Valtaga
Connector	Terminal		Condition	vollage
E142		21 Ground 22	4WD shift switch: 2WD	Approx. 5 V
	21		4WD shift switch: 4H	Approx. 5 V
			4WD shift switch: 4LO	Approx. 0 V
			4WD shift switch: 2WD	Approx. 5 V
	22		4WD shift switch: 4H	Approx. 5 V
			4WD shift switch: 4LO	Approx. 0 V

Is any DTCs detected?

YES >> INSPECTION END NO >> GO TO 2.

2. CHECK RANGE SENSOR CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Disconnect range sensor harness connector.
- 4. Check the continuity between transfer control unit harness connector and range sensor harness connector.

Transfer control unit		Range sense	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E142	21	– F218 (with Cummins 5.0L)	1	
	22		2	Eviated
	21		1	Existed
	22		2	

5. Check the continuity between mode sensor harness connector and ground.

Range sensor		Continuity		
Connector	Terminal		Continuity	
E218 (with Cummins 5.01)	1		Not ovisted	
1210 (with Currining S.OL)	2	Ground		
	1	Ground	NOT EXISTED	
F9 (with VK50VD)	2			

Is inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK RANGE SENSOR GROUND

Check the continuity between mode sensor harness connector and ground.

Range sense		Continuity		
Connector	Terminal		Continuity	
F218 (with Cummins 5.0L)	3	Ground	Existed	
F9 (with VK56VD)	5	Ground	LAISted	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK RANGE SENSOR

P182A TRANSFER HI-LO POSITION SENSOR < DTC/CIRCUIT DIAGNOSIS > [TRANSFER: TX91A] Check the range sensor. Refer to DLN-81. "Component Inspection". Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair range sensor. Refer to <u>DLN-110. "Removal and Installation"</u>.

Component Inspection

1.CHECK RANGE SENSOR

- 1. Turn the ignition switch OFF.
- 2. Remove range sensor. Refer to DLN-110, "Removal and Installation".
- 3. Check the continuity between range sensor harness connector terminals.

Range sensor Terminal		Condition	Continuity
		Condition	Continuity
1	1 2	While pushing switch of range sensor.	Existed
1 5	5	Other than the above.	Not existed
2 3	з	While pushing switch of range sensor.	Existed
	5	Other than the above.	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace range sensor. Refer to <u>DLN-110, "Removal and Installation"</u>.

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P1855 VEHICLE SPEED SENSOR (RR)

< DTC/CIRCUIT DIAGNOSIS >

P1855 VEHICLE SPEED SENSOR (RR)

DTC Description

INFOID:000000012556158

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in vehicle speed signal that is output from combination meter through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
	P1855 VHCL SPEED SEN-RR (Vehicle speed sensor-rear)	Diagnosis condition	Vehicle speed: 10 km/h (6 MPH) or more	
P1855 (Signal	Vehicle speed signal	
		Threshold	Malfunction is detected in vehicle speed signal that is out- put from combination meter through CAN communication.	
		Diagnosis delay time	20 seconds or more	

POSSIBLE CAUSE

- Harness or connector (CAN communication line)
- Combination meter

FAIL-SAFE

4WD mode cannot be switched by operating 4WD shift switch.

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

(I) With CONSULT

- 1. Start the engine.
- 2. Drive vehicle and maintain the following conditions for 20 seconds or more.

Vehicle speed : 10 km/h (6 MPH) or more

3. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "P1855" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-82, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556159

1.CHECK COMBINATION METER

Perform the trouble diagnosis of combination meter. Refer to <u>MWI-25, "On Board Diagnosis Function"</u>. <u>Is the inspection result normal?</u>

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P1867 INCOMPLETE SHIFT

DTC Description

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INFOID:000000012556160

[TRANSFER: TX91A]

DTC DETECTION LOGIC

Malfunction is detected in transfer shift function.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		С
		Diagnosis condition	When all of the following conditions are satisfied:Engine running4WD shift switch is switched	DLN
P1867	(Incomplete Shift)	Signal	_	
		Threshold	Malfunction is detected in transfer shift function.	E
		Diagnosis delay time	20 seconds or more	

POSSIBLE CAUSE

- Transfer assembly
- Transfer motor

FAIL-SAFE

No impact to vehicle behavior.

DTC CONFIRMATION PROCEDURE

1.preconditioning	
If "DTC CONFIRMATION PROCEDURE" wait at least 10 seconds before conductin	has been previously conducted, always turn ignition switch OFF and ig the next test.
>> GO TO 2.	

2.DTC REPRODUCTION PROCEDURE

		0
With CONSULT		
1. Turn the ignition switch OFF.		1Z
2. Start the engine.		K
3. Turn the 4WD shift switch 2WD \Leftrightarrow 4H \Leftrightarrow 4LO.		
CAUTION:		
Hold the 4WD shift switch at each position for 20 seconds or more.		L
Perform self-diagnosis for "ALL MODE AWD/4WD".		
Is DTC "P1867" detected?		
YES >> Proceed to diagnosis procedure. Refer to <u>DLN-83, "Diagnosis Procedure"</u> .		Μ
NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident"		
NO-2 >> Confirmation after repair: INSPECTION END		
Diagnosis Procedure		N
	INFOID:000000012556161	14
I ORECK TRANSFER MOTOR CIRCUIT		

- 1. Turn ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Disconnect transfer motor harness connector.
- 4. Check the continuity between transfer control unit harness connector and transfer motor harness connector.

P1867 INCOMPLETE SHIFT

< DTC/CIRCUIT DIAGNOSIS >

Transfer of	control unit	Transfer motor		Continuity
Connector	Terminal	Connector	Terminal	Continuity
	11	F221 (with	1	
E142	12	Cummins 5.0L)	4	Not existed
	11	F27 (with	1	
	12	VK56VD)	4	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. СНЕСК DTC

Perform the "DTC CONFIRMATION PROCEDURE". Refer to <u>DLN-83. "DTC Description"</u>. <u>Is DTC "P1867" detected?</u>

YES >> Replace the transfer assembly. Refer to <u>DLN-116, "Removal and Installation"</u>.

NO >> INSPECTION END

P186C INCOMP RPS OFFSET LEARNING

< DTC/CIRCUIT DIAGNOSIS >

P186C INCOMP RPS OFFSET LEARNING

DTC Description

DTC DETECTION LOGIC

When turning the ignition switch ON, rotary position sensor offset value memorized by transfer control unit is abnormal.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition				
		Diagnosis condition	Ignition switch: ON	DLN		
	INCOMP RPS OFFSET	Signal	_			
P186C	LEARNING (Incomplete rotary position sensor offset learning)	Threshold	When turning the ignition switch ON, rotary position sensor offset value memorized by transfer control unit is abnormal.	E		
		Diagnosis delay time		_		
POSSIBLE CA	AUSE I unit			F		
FAIL-SAFE				G		
4WD mode car	not be switched by opera	ting 4WD shift switc	h.	0		
DTC CONFIR	MATION PROCEDURE					
1.PRECONDI	TIONING			Н		
If "DTC CONFI wait at least 10	If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.					
>> G() TO 2					
2.DTC REPRO	DUCTION PROCEDURE	Ξ		J		
With CONS	ULT			-		
1. Turn the ig	nition switch ON.			K		
Is DTC "P186C	" detected?					
YES >> Proceed to diagnosis procedure. Refer to <u>DLN-85, "Diagnosis Procedure"</u> . NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u> . NO-2 >> Confirmation after repair: INSPECTION END						
Diagnosis Procedure						
1 .REPLACE T	HE TRANSFER CONTRO	OL UNIT				
Replace the transfer control unit. Refer to DLN-100, "Removal and Installation".						
>> WORK END						

[TRANSFER: TX91A]

INFOID:000000012556162

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U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012556164

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

Transfer control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition		
U1000 CAN COMM CIRCUIT (CAN communication circuit)	Diagnosis condition	Ignition switch: ON		
	CAN COMM CIRCUIT (CAN communication circuit)	Signal	CAN communication signal	
		Threshold	Transfer control unit is not sending or receiving CAN com- munication	
		Diagnosis delay time	2 seconds or more	

POSSIBLE CAUSE

CAN communication error

Each control unit

FAIL-SAFE

4H – 4LO switching is prohibited when a malfunction occurs in communications of ECM, TCM, or BCM.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

With CONSULT

- 1. Turn the ignition switch OFF to ON.
- 2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is DTC "U1000" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-86, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000012556165

Proceed to LAN-51, "Trouble Diagnosis Flow Chart".

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL UNIT (CAN)

DTC Description

DTC DETECTION LOGIC

Detecting error during the initial diagnosis of CAN controller of transfer control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition					
		Diagnosis condition	Ignition switch: ON				
U1010		Signal	_	DL			
	[Control unit (CAN)]	Threshold	Error detected during the initial diagnosis of CAN controller of transfer control unit.				
		Diagnosis delay time	Within 1 second	E			
POSSIBLE C Transfer contro	AUSE ol unit			F			
FAIL-SAFE				I			
4WD mode ca	nnot be switched by opera	ting 4WD shift switc	h.				
DTC CONFIR	MATION PROCEDURE			G			
1.PRECOND	ITIONING						
If "DTC CONF	RMATION PROCEDURE	has been previous	y conducted, always turn ignition switch OFF and	Н			
wait at least 10) seconds before conduction	ng the next test.					
				I			
		_					
1. Turn the ic	JULI anition switch OFF to ON.			J			
2. Perform se	elf-diagnosis for "ALL MOE	DE AWD/4WD".					
Is DTC "U1010	<u>)" detected?</u>			Κ			
YES >> Pr NO-1 >> To	oceed to diagnosis proced	lure. Refer to <u>DLN-8</u> on before repair: Re	7, "Diagnosis Procedure". fer to GL-43, "Intermittent Incident"				
NO-2 >> Co	onfirmation after repair: INS	SPECTION END	ier to <u>or to, intermittent insident</u> .	I			
Diagnosis F	Procedure		INFOID:000000012556167				
1		_					
I.CHECK IR	ANSFER CONTROL UNI			M			
Check transfer	control unit harness conn	ector for disconnect	ion and deformation.				
	on result normal?	Pofor to DLN 100	"Pomoval and Installation"	Ν			
NO >> Re	epair or replace error-detect	cted parts.					
				0			
				0			

INFOID:000000012556166

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

1.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (1)

- 1. Turn the ignition switch OFF.
- 2. Disconnect transfer control unit harness connector.
- 3. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage
Connector	Terminal		voltage
E142	1	Ground	Battery voltage

4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage
Connector	Terminal		voltage
E142	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (2)

- 1. Turn the ignition switch OFF.
- 2. Check the 10A fuse (#59).
- 3. Check the harness for open or short between transfer control unit harness connector No.1 terminal and fuse box.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>PG-13</u>, "Wiring Diagram <u>BAT-</u> <u>TERY POWER SUPPLY - WITH Cummins 5.0L -"</u>.
- NO >> Repair or replace error-detected parts.

3.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (3)

- 1. Turn the ignition switch OFF.
- 2. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage
Connector	Terminal		voltage
E142	4	Ground	Approx. 0 V

3. Turn the ignition switch ON. CAUTION:

Never start the engine.

4. Check the voltage between transfer control unit harness connector and ground.

Transfer o	control unit		Voltage	
Connector	Terminal		Voltage	
E142	4	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 5. NO >> GO TO 4.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[TRANSFER: TX91A]

4.CHECK TRANSFER CONTROL UNIT POWER SUPPLY (4) А 1. Turn the ignition switch OFF. Check the 10A fuse (#30). 2. 3. Disconnect fuse block (J/B) harness connector. В Check the continuity between transfer control unit harness connector and fuse block (J/B) harness con-4. nector. Fuse block (J/B) Transfer control unit Continuity Connector Terminal Connector Terminal M69 1M E142 4 Existed DLN Check the continuity between transfer control unit harness connector and the ground. 5. Ε Transfer control unit Continuity Connector Terminal E142 4 Ground Not existed F Is the inspection result normal? YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-71. "Wiring Diagram -IGNITION POWER SUPPLY - WITH Cummins 5.0L -". NO >> Repair or replace error-detected parts. 5. CHECK TRANSFER CONTROL UNIT GROUND Н 1. Turn the ignition switch OFF. 2. Check the voltage between transfer control unit harness connector and ground. Transfer control unit Voltage Connector Terminal 2 E142 Approx. 0 V Ground 3 Check the continuity between transfer control unit harness connector and ground. 3. Κ Transfer control unit Continuity Connector Terminal L 2 E142 Ground Existed 3 Is the inspection result normal? Μ YES >> INSPECTION END NO >> Repair or replace error-detected parts. Ν Ρ

4WD WARNING LAMP

Component Function Check

1.CHECK 4WD WARNING LAMP FUNCTION

Check that 4WD warning lamp turns ON until the engine started.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed diagnosis procedure. Refer to <u>DLN-90, "Diagnosis Procedure"</u>.

Diagnosis Procedure

1. CHECK DTC OF TRANSFER CONTROL UNIT

(I) With CONSULT

1. Turn the ignition switch ON.

2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is any DTCs detected?

YES >> Check DTC detected item. Refer to <u>DLN-28, "DTC Index"</u>.

NO >> GO TO 2.

2.CHECK 4WD WARNING LAMP SIGNAL

(I) With CONSULT

1. Start the engine. CAUTION:

Stop the vehicle.

2. Check "4WD FAIL LAMP" in "DATA MONITOR" for "ALL MODE AWD/4WD".

Does the item on "DATA MONITOR" indicate "Off"?

YES >> Check input/output signals of combination meter. Refer <u>MWI-30, "Reference Value"</u>.

NO >> Replace transfer control unit. Refer to <u>DLN-100, "Removal and Installation"</u>.

INFOID:000000012556172

4WD INDICATO	DR		٨		
Component Function Check					
1.CHECK 4WD INDI	CATOR FUNCTION		В	3	
 Start the engine CAUTION: Never drive the v Turn the 4WD shi Check the 4WD s DLN 21 "INFORM 	vehicle. ift switch 2WD \rightarrow 4H \rightarrow shift switch position and	4LO. I the indication of the 4WD indicat	or mutually coincide. Refer to		
Is the inspection result	It normal?		DL	N	
YES >> INSPECT NO >> Proceed t	TION END to diagnosis procedure.	Refer to <u>DLN-91, "Diagnosis Proc</u>	edure".	-	
Diagnosis Procee	dure		INFOID:000000012556175		
1.CHECK DTC OF T	RANSFER CONTROL	UNIT	F		
 With CONSULT Turn the ignition s Perform self-diag Is any DTCs detected 	switch ON. nosis for "ALL MODE A 2	WD/4WD".	G)	
YES >> Check DTC detected item. Refer to <u>DLN-28, "DTC Index"</u> . NO >> GO TO 2.					
	CATOR SIGNAL				
1. Start the engine.			1		
 Never drive the v Turn the 4WD shi Check "4WD MO 	vehicle. ift switch 2WD \rightarrow 4H \rightarrow DE IND" of CONSULT "	4LO. DATA MONITOR" for "ALL MODE	J AWD/4WD".		
Monitor itom	Condition	Statua	K	(
	4WD shift switch: 2WD	2WD			
4WD MODE IND	4WD shift switch: 4H	LOCK	L	_	
	4WD shift switch: 4LO	4L			
Is the inspection result	It normal?		Ν	Л	
YES >> Check inp NO >> Replace t	out/output signals of cor transfer control unit. Ref	nbination meter. Refer <u>MWI-30, "R</u> er to <u>DLN-100, "Removal and Insta</u>	eference Value".	I	
			Ν	Į	
			С)	
			P)	

< DTC/CIRCUIT DIAGNOSIS >

SYMPTOM DIAGNOSIS

HEAVY TIGHT-CORNER BRAKING SYMPTOM OCCURS

Description

INFOID:000000012556176

Heavy tight-corner braking symptom may occur depending on driving conditions (4WD mode is 4H and 4LO). This is not malfunction.

NOTE:

- Light tight-corner braking symptom may occur depending on driving conditions. This is not malfunction.
- 4WD warning lamp may blink.

[TRANSFER:	TX91A]
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4WD MODE DOES NOT CHANGE	~
Description	A
Vehicle does not enter 4-wheel drive mode even though 4WD warning lamp turned to OFF.	В
Diagnosis Procedure	I
1. CHECK DTC OF TRANSFER CONTROL UNIT	С
 With CONSULT 1. Turn the ignition switch ON. 2. Perform self-diagnosis for "ALL MODE AWD/4WD". Is any DTC detected? 	DLN
YES >> Check DTC detected item. Refer to <u>DLN-28, "DTC Index"</u> .	Е
2. CHECK INFORMATION DISPLAY (COMBINATION METER)	
Perform the trouble diagnosis of combination meter. Refer to MWI-25, "On Board Diagnosis Function".	F
Is the inspection result normal? YES >> Check intermittent incident. Refer to GI-43, "Intermittent Incident". NO >> Repair or replace the error-detected parts.	G
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< SYMPTOM DIAGNOSIS >

4WD INDICATOR CONTINUES BLINKING

< SYMPTOM DIAGNOSIS >

4WD INDICATOR CONTINUES BLINKING

Description

After shift the 4WD mode 4H to 4L, 4WD indicator continues to blink.

Diagnosis Procedure

1.CHECK OPERATION CONDITION OF 4WD MODE

- 1. Turn ignition switch OFF.
- 2. Shift the 4WD mode depending on operation condition. Refer to <u>DLN-17, "4WD SYSTEM : System</u> <u>Description"</u>.

Does the 4WD indicator stop to blink?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK 4WD INDICATOR LAMP

Check 4WD indicator function. Refer to DLN-91, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 3.

NO >> Proceed to diagnosis procedure. Refer to <u>DLN-91, "Diagnosis Procedure"</u>.

 ${\it 3.}$ check dtc of transfer control unit

With CONSULT

- Turn the ignition switch ON.
- 2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is any DTC detected?

- YES >> Check DTC detected item. Refer to <u>DLN-28, "DTC Index"</u>.
- NO >> Transfer assembly is mechanical malfunction. Replace transfer assembly. Refer to <u>DLN-116</u>, <u>"Removal and Installation"</u>.

INFOID:000000012556179

4WD WARNING LAMP BLINKS SLOWLY

< SYMPTOM DIAGNOSIS > [TRANSFER: TX91A]
4WD WARNING LAMP BLINKS SLOWLY
Description
4WD warning lamp blinks at approximately 2 seconds intervals while driving.
Diagnosis Procedure
1.CHECK TIRE
 Check the following. Tire pressure Wear condition Front and rear tire size (There is no difference between front and rear tires.)
Is the inspection result normal? YES >> GO TO 2. NO >> Repair or replace error-detected parts. And then, drive the vehicle at speed of 20 km/h (12 MPH) or more for 5 seconds or more. Improper size information is initialized accordingly.
2. TERMINAL INSPECTION
Check intermittent incident. Refer to GI-43, "Intermittent Incident".
Is the inspection result normal? YES >> Replace transfer control unit. Refer to DLN-100, "Removal and Installation". NO >> Repair or replace the error-detected parts.

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ATP WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

ATP WARNING LAMP DOES NOT TURN ON

Description

ATP warning lamp does not turn ON when 4WD shift switch from 4H to 4LO or 4LO to 4H with A/T selector lever in P position.

Diagnosis Procedure

INFOID:000000012556184

INFOID:000000012556183

1. CHECK DTC OF TRANSFER CONTROL UNIT

With CONSULT

1. Turn the ignition switch ON.

2. Perform self-diagnosis for "ALL MODE AWD/4WD".

Is any DTC detected?

YES >> Check DTC detected item. Refer to <u>DLN-28, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK COMBINATION METER

Perform the trouble diagnosis of combination meter. Refer to <u>MWI-25, "On Board Diagnosis Function"</u>. <u>Is the inspection result normal?</u>

YES >> Check intermittent incident. Refer to GI-43, "Intermittent Incident".

NO >> Repair or replace the error-detected parts.

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING [TRANSFER: TX91A] < SYMPTOM DIAGNOSIS >

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012556185

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Use the chart below to find the cause of the symptom. The numbers indicate the order of the inspect	ion. If nec-	1
essary, repair or replace these parts.		

Reference			DLN-98, "Inspection"		I	Front oil seal: <u>DLN-102. "Exploded View"</u> Rear oil seal: <u>DLN-104. "Exploded View"</u>	I	I	I	C DL E
SUSPECTED PARTS (Possible cause)		TRANSFER FLUID (Level Iow)	TRANSFER FLUID (Wrong)	TRANSFER FLUID (Level too high)	LIQUID GASKET (Damaged)	OIL SEAL (Worn or damaged)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	TRANSFER CASE (Damaged)	G H J
Symptom	Noise	1	2				3	3	3	-
	Transfer fluid leakage		4	1	2	2			3	K

NOTE:

When transfer inner parts are malfunction, replace transfer assembly.

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< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE TRANSFER FLUID

Inspection

FLUID LEAKS

Check transfer surrounding area (oil seal, drain plug, and filler plug etc.) for fluid leaks.

FLUID LEVEL

 Remove filler plug (1). Then check that fluid is filled from hole for the filler plug. CAUTION:

Do not start engine while checking fluid level.

- 2. Transfer oil level (A) should be level with bottom of filler plug hole.
- Apply sealant to thread of filler plug (1), and install it on transfer and then tighten to the specified torque.
 CAUTION:

Remove old sealant adhering to thread of filler plug.

Specified torque	: 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant	: Hylomar 102 silicone or equivalent

Draining

- 1. Stop the engine.
- 2. Remove the drain plug (1) and drain transfer fluid.
- Apply sealant to thread of drain plug, and install it to transfer and tighten to the specified torque.
 CAUTION:

Remove old sealant adhering to thread of drain plug.

Specified torque	: 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant	: Hylomar 102 silicone or equivalent



INFOID:000000012556188

Refilling

1. Remove filler plug (1). Fill with new transfer fluid up to hole for the filler plug (A).

Recommended fluid and capacity

: Refer to <u>MA-59, "Cummins</u> (5.0L V8D) Engine : Fluids and <u>Lubricants"</u> (Cummins 5.0L models), <u>MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants"</u> (VK56VD models).



CAUTION:

Carefully fill the fluid. (Fill for approximately 3 minutes.)

- 2. Leave the vehicle for 3 minutes, and check the fluid level again.
- 3. Apply sealant to thread of filler plug, and install it on transfer and tighten to the specified torque. CAUTION:

Remove old sealant adhering to thread of filler plug.



INFOID:000000012556187



Specified torque Sealant	: 20.5 N⋅m (2.1 kg-m, 15 ft-lb) : Hylomar 102 silicone or equivalent	A
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REMOVAL AND INSTALLATION TRANSFER CONTROL UNIT

Exploded View

INFOID:000000012556189

INFOID:000000012556190

[TRANSFER: TX91A]



1. Transfer control unit

: Front

Removal and Installation

REMOVAL

- 1. Turn the ignition switch OFF.
- 2. Disconnect the harness connector (A) from the transfer control unit (1).
- 3. Remove nuts (B) and remove transfer control unit (1).

<⊐ : Front



INSTALLATION

Installation is in the reverse order of removal.

< REMOVAL AND INSTALLATION > **4WD SHIFT SWITCH** А Removal and Installation INFOID:000000012556191 REMOVAL В Remove cluster lid C finisher (LH). Refer to IP-16, "CLUSTER LID C FINISHER : Removal and Installa-1. tion". С 2. Disconnect the harness connector from 4WD shift switch. 3. Remove the 4WD shift switch. INSTALLATION DLN Installation is in the reverse order of removal. Inspection INFOID:000000012556192 Ε **INSPECTION AFTER INSTALLATION** Check that the actual 4WD mode and the indication of the 4WD indicator mutually coincide when the 4WD shift switch is switched to each position. F Н J Κ L Μ Ν Ο Ρ

FRONT OIL SEAL

Exploded View

INFOID:000000012556193



1. O-ring

- 2. Front companion flange
- 3. Front oil seal

4. Transfer assembly

VK56VD Models



4. Transfer assembly

Removal and Installation

INFOID:000000012556194

REMOVAL

- 1. Remove the drain plug to drain the transfer fluid. Refer to <u>DLN-98, "Draining"</u>.
- 2. Remove the front propeller shaft. Refer to <u>DLN-123, "Removal and Installation"</u>.
- 3. Remove self-lock nut from companion flange using suitable tool. CAUTION:

Do not reuse self-lock nut.

4. Remove the O-ring.

Revision: March 2016

DLN-102

2016 Titan NAM

CAUTION:

- Do not reuse O-ring. 5. Put a matching mark on top of the front output shaft (B) in line
- with the mark on the front companion flange (A). **CAUTION:**

Use paint to make the matching mark on the front drive companion flange and front output shaft. Do not damage the front drive shaft.

- Remove the front companion flange, using suitable tool.
- Remove front oil seal. CAUTION:
 - Do not damage the front case or front output shaft.
 - Do not reuse front oil seal.

INSTALLATION

- 1. Install front oil seal using suitable tool until the end of the seal is flush with the face of front case.
 - CAUTION:

CAUTION:

locking nut.

- Do not reuse front oil seal.
- Apply transfer fluid onto circumference of oil seal.







- 2. Align the matching mark on the front drive shaft (B) with the matching mark on the front companion flange (A), then install 3. Install the O-ring between front companion flange and the self
 - **CAUTION:** • Do not reuse the O-ring.

the front companion flange.

- Do not damage the O-ring.
- Tighten the self-lock nut to specified torque. CAUTION:

Do not damage the front oil seal lip.

Do not reuse self-lock nut.

- Install front propeller shaft. Refer to DLN-123, "Removal and Installation".
- Fill with new transfer fluid. Refer to <u>DLN-98</u>, "<u>Refilling</u>".

Inspection

INSPECTION AFTER INSTALLATION Check for fluid leaks and the fluid level. Refer to DLN-98, "Inspection".

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REAR OIL SEAL

Exploded View

INFOID:000000012556196

[TRANSFER: TX91A]



- 1. O-ring
- 4. Transfer assembly

Removal and Installation

INFOID:000000012556197

REMOVAL

- 1. Remove the drain plug to drain the transfer fluid. Refer to <u>DLN-98, "Draining</u>".
- 2. Remove the rear propeller shaft. Refer to <u>DLN-133</u>, "Removal and Installation".

2. Companion flange

3. Remove self-lock nut from companion flange using suitable tool. CAUTION:

Do not reuse self-lock nut

- 4. Remove the O-ring. CAUTION: Do not reuse O-ring
- 5. Put a matching mark on top of the front output shaft (B) in line with the mark on the front companion flange (A). CAUTION:

Use paint to make the matching mark on the rear drive companion flange and rear output shaft. Do not damage the rear output shaft.



3. Rear oil seal

6. Remove the companion flange using suitable tool.

7. Remove the rear oil seal. CAUTION:

- Do not damage rhe rear case and main shaft.
- Do not reuse rear oil seal.

INSTALLATION

REAR OIL SEAL

< REMOVAL AND INSTALLATION >

1. Install rear oil seal with Tool until the end is flush with the face of front case.

: KV40104710 (—)

CAUTION:

Tool number

- Do not reuse rear oil seal.
- Apply transfer fluid onto circumference of oil seal.



[TRANSFER: TX91A]

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2. Align the marching mark on the front drive shaft (B) with the matching mark on the front companioon flange (A), then install the front companion flange. **CAUTION:**

Do not damage the fron oil seal lip.



3.	 Install the O-ring between fron sompanion flange and the self locking nut. CAUTION: Do not reuse the O-ring. Do not damage the O-ring. 	Н
4.	Tighten the self-lock nut to the specified torque. CAUTION: Do not reuse self-locking nut.	I
5.	Install the rear propeller shaft. Refer to DLN-133, "Removal and Installation".	J
6.	Fill with ne transfer fluid. Refer to <u>DLN-98, "Refilling"</u> .	
Ins	pection	2556198 K
INS Che	SPECTION AFTER INSTALLATION eck for fluid leaks and the fluid level. Refer to <u>DLN-98, "Inspection"</u> .	L

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TRANSFER ROTARY POSITION SENSOR

< REMOVAL AND INSTALLATION >

TRANSFER ROTARY POSITION SENSOR

Exploded View

INFOID:000000012556199

[TRANSFER: TX91A]



- 1. Transfer assembly
- 2. Transfer rotary position sensor

Removal and Installation

REMOVAL

- 1. Disconnect the negative battery cable.
- 2. Disconnect the harness connector from the transfer rotary position sensor.
- 3. Remove the transfer rotary position sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Do not damage the O-ring on the transfer rotary position sensor.

Inspection and Adjustment

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to DLN-98, "Inspection".

ADJUSTMENT AFTER INSTALLATION

When replacing transfer rotary position sensor, clear the transfer rotary position sensor learning value stored in transfer control unit. Refer to <u>DLN-44</u>, "<u>Description</u>".

INFOID:000000012556200

TRANSFER MOTOR

< REMOVAL AND INSTALLATION >

TRANSFER MOTOR

Exploded View

INFOID:000000012556202

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[TRANSFER: TX91A]



INSTALLATION

2.

Installation is in the reverse order of removal.

- Κ · When installing transfer motor, if there is misalignment between transfer motor axis and actuator shaft, rotate the transfer motor axis by hand.
- Do not damage the O-ring of transfer motor when installing transfer motor.

Inspection

INSPECTION AFTER INSTALLATION Check for fluid leaks and the fluid level. Refer to DLN-98, "Inspection".

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MODE SENSOR

Exploded View

INFOID:000000012556205

[TRANSFER: TX91A]



1. Mode sensor

2. Transfer assembly

VK56VD Models



1. Mode sensor

2. Transfer assembly

Removal and Installation

REMOVAL

- 1. Disconnect the negative battery cable.
- 2. Disconnect the harness connector from the mode sensor.
- 3. Remove the mode sensor.

INSTALLATION

Installation is in the reverse order of removal. CAUTION: Do not damage the O-ring on the mode sensor. INFOID:000000012556206

Revision: March 2016

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2016 Titan NAM
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[TRANSFER: TX91A]

Inspection	INFOID:000000012556207	Δ
INSPECTION AFTER INSTALLATION Check for fluid leaks and the fluid level. Refer to <u>DLN-98, "Inspection"</u> .		~
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RANGE SENSOR

Exploded View

INFOID:000000012556208



1. Transfer assembly

2. Range sensor

VK56VD Models



- 1. Transfer assembly
- 2. Range sensor

Removal and Installation

REMOVAL

- 1. Disconnect the negative battery cable.
- 2. Disconnect the harness connector from the range sensor.
- 3. Remove the range sensor.

INSTALLATION

Installation is in the reverse order of removal. CAUTION: Do not damage the O-ring on the range sensor. INFOID:000000012556209

Revision: March 2016

DLN-110

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[TRANSFER: TX91A]

Inspection	INFOID:000000012556210	Δ
INSPECTION AFTER INSTALLATION Check for fluid leaks and the fluid level. Refer to <u>DLN-98. "Inspection"</u> .		B
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AIR BREATHER

Exploded View

INFOID:000000012556217



- 10. A/T assembly
- Removal and Installation Cummins 5.0L Models

REMOVAL

4.

4.

- 1. Release clip from bracket.
- 2. Release breather hose B from clip and remove breather hose B from connector tube.
- 3. Release breather hose A from clip and remove breather hose A from breather tube.

DLN-112

2016 Titan NAM

INFOID:000000012556218

AIR BREATHER

< REMOVAL AND INSTALLATION >

INSTALLATION

Installation is in the reverse order of removal.

1. Insert the clip of the air breather (1) securely to the bracket (2).

2. Insert the clips on the hose (1) securely into the A/T assembly (2).

3. Set breather hose A (1) to the breather tube (2) with the paint mark (A) facing upward.

NOTE:

Be sure to insert breather hose A (1) to breather tube (2) until hose end reaches the bending radius of tube.

- \triangleleft : Front
- 4. When inserting breather hose A and breather hose B to hose connector (1), be sure to insert it fully until its reaches the stop. **CAUTION:** Align paint marks (A) on each breather hose.





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AIR BREATHER

< REMOVAL AND INSTALLATION >

5. Secure transfer breather hose (1) to A/T breather hose (2) at paint marks (A) with clip (3).



INFOID:000000013761279

Removal and Installation - VK56VD Models

REMOVAL

- 1. Release clip from bracket.
- 2. Release breather hose A from connector tube and remove breather hose A from clip.
- 3. Release breather hose B from clip and remove breather hose B from connector tube.
- 4. Release breather hose C from clip and remove breather hose C from breather tube.

INSTALLATION

Installation is in the reverse order of removal.

1. Insert the clip of the air breather (2) securely to the bracket (1).

2. Insert the clip on breather hose B (1) securely into the bracket (2).





3. Insert breather hose A (1) into the clip (2) with the paint mark (A) facing upward.



AIR BREATHER

< REMOVAL AND INSTALLATION >

[TRANSFER: TX91A]

Set breather hose C (1) to the breather tube (2) with the paint mark facing upward.
 NOTE:

Be sure to insert breather hose C (1) to breather tube (2) until hose end reaches the bending radius of tube.

← : Front



5. When inserting breather hose A and breather hose B to hose connector (1), and breather hose B and breather hose C to hose connector, be sure to insert it fully until its reaches the stop. CAUTION:

Align paint marks (A) on each breather hose.



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[TRANSFER: TX91A]

UNIT REMOVAL AND INSTALLATION TRANSFER ASSEMBLY

Exploded View

INFOID:000000012556221



1. Transfer assembly

VK56VD



1. Transfer assembly

Removal and Installation

INFOID:000000012556222

- REMOVAL
- 1. Remove rear propeller shaft. Refer to <u>DLN-133, "Removal and Installation"</u>.
- 2. Remove front propeller shaft. Refer to DLN-123, "Removal and Installation".
- 3. Disconnect the harness connectors from the transfer motor, transfer rotary position sensor, mode sensor, and range sensor and separate harnesses from transfer assembly.
- 4. Remove transfer breather hose A from transfer assembly. Refer to <u>DLN-112, "Exploded View"</u> (Cummins 5.0L models), <u>DLN-114, "Removal and Installation VK56VD Models"</u> (VK56VD models).

DLN-116

TRANSFER ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

5. Support transfer assembly (1) with a jack (A). CAUTION: Secure transfer assembly to a jack.



Remove transfer mounting bolts and separate transfer from A/T assembly. 6. CAUTION: Secure transfer assembly to a jack.

INSTALLATION

Installation in the reverse order of removal.

Cummins 5.0L Models:

• When installing the transfer to the A/T assembly, install the bolts following the standard below, tighten bolts to the specified torque.

Bolt symbol	А	В
Insertion direction	Transmission to transfer	Transfer to transmission

*Tighten bolt with bracket



VK56VD Models:

• When installing the transfer to the A/T assembly, install the bolts following the standard below, tighten bolts to the specified torque.

Bolt symbol	А	В
Insertion direction	Transmission to transfer	Transfer to transmission

*Tighten bolt with bracket



Inspection and Adjustment

INSPECTION AFTER INSTALLATION

Check for fluid leaks and the fluid level. Refer to DLN-98, "Inspection".

ADJUSTMENT AFTER INSTALLATION

When replacing transfer assembly, clear the transfer rotary position sensor learning value stored in transfer control unit. Refer to DLN-44, "Description".

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INFOID:000000012556223

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[TRANSFER: TX91A]

SERVICE DATA AND SPECIFICATIONS (SDS) SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:000000012556224

	Axle	4WD			
Applied model	Engine	Cummins 5.0L	VK56VD		
	Transmission	6 A/T	7 A/T		
Transfer model	-	TX91A			
Coor ratio	4H	1.000			
4LO 2.717			/17		
Fluid capacity 1.8 ℓ (3-7/8 US pt, 3-1/8 Imp pt)					

< PRECAUTION >

PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

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< PREPARATION >

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:000000012544389

Tool name		Description
Power tool		Loosening nuts, screws and bolts
	PIIB1407E	

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING < SYSTEM DESCRIPTION > [FRONT PROPELLER SHAFT: 2F (Double Cardan)]

SYSTEM DESCRIPTION

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000012544390

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Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		DLN-123	DLN-123	DLN-127	DLN-147	FAX-5	FSU-5	WT-64	WT-64	DLN-122	<u>BR-7</u>	<u>ST-32</u>	
Possible cause and suspected parts	S	Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering	E
	Noise	×	×	×	×	×	×	×	×	×	×	×	
Symptom	Shake					×	×	×	×	×	×	×	G
	Vibration	×	×	×		×	×	×		×		×	

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BASIC INSPECTION PROPELLER SHAFT ASSEMBLY

Inspection

INFOID:000000013268439

APPEARANCE AND NOISE INSPECTION

- Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check bearings for damage and noise. If damaged, replace as necessary.

PROPELLER SHAFT VIBRATION

NOTE:

If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

1. Measure the runout of the propeller shaft tube using suitable tool at several points by rotating the final drive companion flange with your hands.

Propeller shaft runout : Refer to <u>DLN-127, "General</u> <u>Specification"</u>.



- 2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
- 3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.
 - (A) : Runout measuring range
 - <⊐ : Front
- 4. After installation, check for vibration by driving the vehicle.



FRONT PROPELLER SHAFT < UNIT REMOVAL AND INSTALLATION > [FRONT PROPELLER SHAFT: 2F (Double Cardan)] UNIT REMOVAL AND INSTALLATION

FRONT PROPELLER SHAFT

Exploded View

INFOID:000000013268440 B

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Removal and Installation

REMOVAL

 Put matching marks on the front propeller shaft flange yoke and the front final drive companion flange as shown.
 CAUTION:

For matching marks, use paint. Do not damage the flange yoke and companion flange of the front final drive.

 Put matching marks on the front propeller shaft flange yoke and the transfer companion flange.
 CAUTION:

For matching marks, use paint. Do not damage the flange yoke and companion flange of the transfer case.



INFOID:000000012544392

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FRONT PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

DN > [FRONT PROPELLER SHAFT: 2F (Double Cardan)]

3. Remove the bolts and then remove the front propeller shaft from the front final drive and transfer.

INSPECTION

 Inspect the propeller shaft runout using suitable tool. If runout exceeds the limit, replace the propeller shaft assembly. Refer to <u>DLN-127</u>, "General Specification".



- While holding the flange yoke on one side, check axial play of the joint as shown. If the journal axial play exceeds the specification, repair or replace the journal parts. Refer to <u>DLN-127</u>, "General <u>Specification"</u>.
- Check the propeller shaft tube surface for dents or cracks. If damage is detected, replace the propeller shaft assembly.



INSTALLATION

Installation is in the reverse order of removal.

- After installation, check for vibration by driving the vehicle. Refer to <u>DLN-121, "NVH Troubleshooting Chart"</u>. CAUTION:
- Do not reuse the bolts and nuts. Always install new ones.
- Do not reuse snap rings.

UNIT DISASSEMBLY AND ASSEMBLY FRONT PROPELLER SHAFT

Disassembly and Assembly

DISASSEMBLY

Journal

1. Put matching marks on the front propeller shaft and flange yoke as shown.

CAUTION:

For matching marks, use paint. Do not damage the front propeller shaft or flange yoke.



Remove the snap rings.
 CAUTION:
 Do not reuse snap rings.



Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.

- SPD732
- 4. Push out and remove the remaining journals at the opposite side by lightly tapping the flange yoke with a suitable tool, taking care not to damage the journal or flange yoke hole. **NOTE:**

Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



ASSEMBLY



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INFOID:000000012544393

FRONT PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

MBLY > [FRONT PROPELLER SHAFT: 2F (Double Cardan)]

🔊 Snap

ring

Journal

1. Assemble the journal bearings. Apply multipurpose grease on the bearing inner surface.

NOTE:

During assembly, use caution so that the needle bearings do not fall down.



To REMOVE

pliers

SQUEEZE ends with

Reverse to INSTALL

APD012

SPD732

Install new snap rings that will provide the specified play in an axial direction of the journal.
 CAUTION:

Do not reuse snap rings.

3. Adjust the thrust clearance between the bearing and snap ring to zero by tapping the yoke.







SERVICE DATA AND SPECIFICATIONS (SDS) < SERVICE DATA AND SPECIFICATIONS (SDS) [FRONT PROPELLER SHAFT: 2F (Double Cardan)] SERVICE DATA AND SPECIFICATIONS (SDS) А SERVICE DATA AND SPECIFICATIONS (SDS) **General Specification** INFOID:000000012544394 В Unit mm (in) 4WD Applied model 2F (Double Cardan) Propeller shaft model Number of joints 2 DLN Coupling method with front final drive Flange type Coupling method with transfer Flange type $660.7 \pm 1.5 \; (26.01 \pm 0.06)$ Installed shaft length (Spider to spider) Ε 76.2 (3) Shaft outer diameter PROPELLER SHAFT RUNOUT F Unit mm (in) Item Limit

PROPELLER SHAFT JOINT FLEX EFFORT

Propeller shaft runout

	Unit N⋅m (kg-m, in-lb)
Item	Limit
Propeller shaft joint flex effort	2.26 (0.23, 20) or less
JOURNAL AXIAL PLAY	

0.60 (0.024)

Unit mm (in) Item Limit Journal axial play 0.02 (0.0008) or less

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PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

PREPARATION [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

PREPARATION

PREPARATION

Commercial Service Tool

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NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING < SYSTEM DESCRIPTION > [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

SYSTEM DESCRIPTION

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

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Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		DLN-131	DLN-131	DLN-142	DLN-217	RAX-4	RSU-4	<u>WT-64</u>	<u>WT-64</u>	FAX-5	<u>BR-7</u>	<u>ST-32</u>
Possible cause and suspected parts		Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering
	Noise	×	×	×	×	×	×	×	×	×	×	×
Symptom	Shake					×	×	×	×	×	×	×
	Vibration	×	×	×		×	×	×		×		×

 $\times: \mathsf{Applicable}$

BASIC INSPECTION PROPELLER SHAFT ASSEMBLY

Inspection

APPEARANCE AND NOISE INSPECTION

- · Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.
- · Check bearings for damage and noise. If damaged, replace as necessary.

PROPELLER SHAFT VIBRATION

NOTE:

DLN If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

Measure the runout of the propeller shaft tube at several points 1. by rotating the final drive companion flange with your hands.

> Propeller shaft runout : Refer to DLN-142, "General Specification".



- 2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
- Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly. 3.
- 4. After installation, check for vibration by driving the vehicle.

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UNIT REMOVAL AND INSTALLATION REAR PROPELLER SHAFT

Exploded View

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Always replace after every disassembly

○ : N·m (kg-m, ft-lb)

REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION > [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]



CAUTION:

• Do not damage (A) CVJ boot (1) by bending propeller shaft (2) during removal and installation.



REAR PROPELLER SHAFT < UNIT REMOVAL AND INSTALLATION > [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]



• To prevent damage to CVJ boot use suitable tool during removal and installation.

REMOVAL

- 1. Move the shift selector to the N position and release the parking brake.
- Put matching marks on the rear propeller shaft flange yoke and the companion flange A/T assembly as shown.
 CAUTION:

For matching marks, use paint. Do not damage the rear propeller shaft flange yoke or the companion flange.



3. Put matching marks (A) on the rear propeller shaft flange yoke and the companion flange of the rear final drive as shown. CAUTION:

For matching marks, use paint. Do not damage the rear propeller shaft flange yoke or the companion flange when removing and installing propeller shaft, be careful so as not to let the propeller shaft hang down.





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5. Remove the center support bearing bracket nuts (1), and remove the propeller shaft from the vehicle. **CAUTION:**

Do not damage CVJ boot by bending propeller shaft during removal and installation. Be careful so as not to let the propeller shaft hang down.



- 6. Remove bolts fixing propeller shaft to A/T assembly (2WD) or transfer case (4WD).
- 7. Remove bolts fixing propeller shaft to rear final drive and remove propeller shaft from vehicle.

INSPECTION AFTER REMOVAL

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REAR PROPELLER SHAFT

< UNIT REMOVAL AND INSTALLATION >

- Inspect the propeller shaft runout. If runout exceeds the limit, replace the propeller shaft assembly. Refer to <u>DLN-142</u>, "<u>General</u> <u>Specification</u>".
 - (A) : 3F(2CVJ)
 - (B) : 3S(2CVJ)



[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

- While holding the flange yoke on one side, check axial play of the joint as shown. If the journal axial play exceeds the specification, repair or replace the journal parts. Refer to <u>DLN-142</u>, "<u>General Specification</u>".
- Check the propeller shaft tube for bend and damage. If damage is detected, replace the propeller shaft assembly.



INSTALLATION Installation is in the reverse order of removal. CAUTION:

 Do not damage (A) CVJ boot (1) by bending propeller shaft (2) during removal and installation.



REAR PROPELLER SHAFT < UNIT REMOVAL AND INSTALLATION > [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]



(A)

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B

- To prevent damage to CVJ boot use suitable tool during removal and installation.
- After installation, check for vibration by driving the vehicle. Refer to <u>DLN-130</u>, "NVH Troubleshooting Chart"
- If propeller shaft assembly or final drive assembly has been replaced, connect them as follows:
- Face companion flange mark (A) of the A/T assembly (1) up. With the mark (A) faced up, couple the propeller shaft and the companion flange so that the matching mark (B) of the propeller shaft (2) can be positioned as close as possible with the matching mark (C) of the A/T assembly companion flange.
- Face companion flange mark (A) of the final drive (1) up. With the mark (A) faced up, couple the propeller shaft and the companion flange so that the matching mark (B) of the propeller shaft (2) can be positioned as close as possible with the matching mark (C) of the final drive companion flange.
- Tighten propeller shaft and final drive bolts and nuts to specifications. Refer to <u>DLN-132</u>, "Exploded View".
 CAUTION:

Do not reuse the bolts and nuts. Always install new ones.

- Remove suitable tool (A) to CVJ boots to prevent damage during removal.
 - (A) : Suitable tool
 - (B) : 3F(2CVJ)
 - (C) : 3S(2CVJ)





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UNIT DISASSEMBLY AND ASSEMBLY REAR PROPELLER SHAFT

Disassembly and Assembly

DISASSEMBLY

Journal bearing

1. Put matching marks on the rear propeller shaft and flange yoke as shown.

CAUTION: For matching marks use paint. Do not damage the rear pro-

peller shaft or flange yoke.



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journal bearing or flange yoke hole.





4. Push out and remove the remaining journal bearing at the opposite side by lightly tapping the flange yoke with a suitable tool, taking care not to damage the journal bearing or flange yoke hole.

NOTE:

NOTE:

3.

Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



Center Support Bearing

Remove the propeller shaft assembly from the vehicle. Refer to DLN-133, "Removal and Installation". 1.

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DLN-138



< UNIT DISASSEMBLY AND ASSEMBLY >

- Put matching marks (A) on the propeller shaft tube and the CVJ. CAUTION: For matching marks, use paint. Do not damage the propeller shaft tube or CVJ.
- 3. Remove and discard the clamp near the center support bearing, then slide the CVJ off of propeller shaft tube.



4. Press the center support bearing off the propeller shaft tube using Tool and suitable hydraulic press.

Tool : 205-D002 (—)



ASSEMBLY

Journal bearing

1. Assemble the journal bearings. Apply multipurpose grease on the bearing inner surface.

2. Install new snap rings that will provide the specified play in an

axial direction of the journal, and install them.

NOTE:

CAUTION:

Do not reuse snap rings

During assembly, use caution so that the needle bearings do not fall down.





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REAR PROPELLER SHAFT

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

3. Adjust the thrust clearance between the bearing and snap ring to zero by tapping the yoke.



Make sure that the journal bearing moves smoothly and is below 4. the propeller joint flex effort specification. Refer to DLN-142, "General Specification".

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Center Support Bearing

shaft tube.

- 1. Apply a thin coat of multi-purpose grease to both the propeller shaft tube and the inside surface of the center support bearing.
- Install the center support bearing on the propeller shaft tube 2. using a suitable pipe pressing on the inner race.

3. Install a new clamp over the boot on the CVJ.



- 4. Align the matching marks (A) and install CVJ on the propeller 0
- Clean the surfaces and position the boot over the propeller shaft tube and tighten the clamp. 5.

REAR PROPELLER SHAFT EMBLY > [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

< UNIT DISASSEMBLY AND ASSEMBLY >

6. Install the center support bearing bracket, tighten nuts (1) to specification, and install the rear propeller shaft assembly in the vehicle. Refer to <u>DLN-132</u>, "Exploded View".



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SERVICE DATA AND SPECIFICATIONS (SDS) < SERVICE DATA AND SPECIFICATIONS (SDS) [REAR PROPELLER SHAFT: 3F(2CVJ), 3S(2CVJ)]

SERVICE DATA AND SPECIFICATIONS (SDS) SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

2WD Model

INFOID:000000012544410

		l	Unit: mm (in)				
Applied model		2WD					
Propeller shaft model		3S(2CVJ)					
Number of joints	3						
Coupling method with rear final drive	Flange type						
Coupling method with transmission	Sleeve type						
Installed shaft length	1st (Spider to Flange)	$2395.2\pm4.5~(94.29\pm0.17)$					
Chaft autor diamator	1st	88.9 + 0.00 - 0.13 (3.50 + 0.00 - 0.01)					
Shall outer diameter	2nd	88.9 + 0.00 - 0.13 (3.50 + 0.00 - 0.01)					
4WD Model							
		l	Jnit: mm (in)				

		• · · · · · · · · · · · · · · · · · · ·				
Applied model		4WD				
Propeller shaft model		3F(2CVJ)				
Number of joints		3				
Coupling method with rear final drive	Flange type					
Coupling method with transmission	Flange type					
Installed shaft length	1st (Spider to Flange)	$2023.2 \pm 4.5 \ (79.65 \pm 0.17)$				
Shoft outer diameter	1st	88.9 + 0.00 - 0.13 (3.50 + 0.00 - 0.01)				
	2nd	88.9 + 0.00 - 0.13 (3.50 + 0.00 - 0.01)				

PROPELLER SHAFT RUNOUT

	Unit: mm (in)
Item	Limit
Propeller shaft runout limit	0.60 (0.024) or less

JOURNAL AXIAL PLAY

	Unit: mm (in)
Item	Limit
Journal axial play	0.02 (0.0008) or less

PROPELLER SHAFT JOINT FLEX EFFORT

Unit: N·m (kg-m, in-lb)

Item	Limit
Propeller shaft joint flex effort	2.26 (0.23, 20) or less

< PRECAUTION > PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precaution for Servicing Front Final Drive

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, key be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them M with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

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< PREPARATION > PREPARATION PREPARATION

Special Service Tool

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Commercial Service Tool

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< PREPARATION >

[FRONT FINAL DRIVE: MA235]

(TechMate No.)		Description	Δ
(J-02619-5) Slide hammer		Removing front oil sealRemoving side oil seal	B
	ALDIA07752Z		С
Power tool		Loosening nuts, screws and bolts	DLN
			E
Separator	PIIB1407E	 Removing side bearing inner race. Removing drive pinion rear bearing inner race. 	- F
			G
	ZZA0700D	Describe discut	-
Oil seal remover	X	 Removing side oil seal Removing front oil seal 	I
	JSDIA49982Z		J
Flange wrench		Removing and installing drive pinion lock nut	K
	C		L
 Puller	NT035	Removing companion flange	Μ
			Ν
			0
 (J-45101) Dial indicator set		Measuring Tool	P
	ANDIA1066ZZ		

SYSTEM DESCRIPTION STRUCTURE AND OPERATION

Sectional View

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- 1. Companion flange
- 4. Drive gear
- 7. Side bearing
- 10. Pinion rear bearing
- 2. Pinion front bearing
- 5. Intermediate shaft
- 8. Differential assembly
- 11. Collapsible spacer
- 3. Drive pinion
- 6. Needle bearing
- 9. Differential shim

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING < SYMPTOM DIAGNOSIS > [FRONT FINAL DRIVE: MA235]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

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Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		JLN-159	<mark>0LN-159</mark>	<mark>0LN-159</mark>	JLN-159	JLN-159	JLN-148	JLN-121	FAX-5	FSU-5	<u>WT-64</u>	<u>WT-64</u>	FAX-5	<u>BR-7</u>	<u>ST-32</u>	С
						ц т										DLN
Possible cause and SUSPECT	ED PARTS	Gear tooth rough	Gear contact improper	Tooth surfaces worn	Incorrect backlash	Companion flange excessive runor	Gear oil improper	PROPELLER SHAFT	FRONT AXLE	FRONT SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING	E F G
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Ц
v: Applicable			•													11

×: Applicable

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE FRONT DIFFERENTIAL GEAR OIL

Inspection

OIL LEAKS

Make sure that oil is not leaking from final drive assembly or around it.

OIL LEVEL

1. Check oil level (A) from filler plug hole as shown in the figure after removing filler plug (1) and gasket from final drive assembly.

CAUTION:

Turn the ignition switch OFF while checking oil level.

- Oil level should be level with bottom of filler plug hole.
- 2. Set a gasket on filler plug and install it on final drive assembly. CAUTION:

Do not reuse gasket.

3. Tighten filler plug to the specified torque. Refer to <u>DLN-159</u>, <u>"Disassembly and Assembly"</u>.

Draining

- 1. Turn the ignition switch OFF.
- 2. Remove drain plug (1) and gasket.
- 3. Drain gear oil.
- 4. Install a gasket on drain plug and install it to final drive assembly.



 Tighten drain plug to the specified torque. Refer to <u>DLN-159</u>, <u>"Disassembly and Assembly"</u>.



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Refilling

 Remove filler plug (1) and gasket. Then fill with new gear oil until oil level (A) reaches the specified level near filler plug mounting hole.

CAUTION:

Do not overfill front final drive.

Oil grade and
viscosity: Refer to MA-13, "VK56VD Gasoline En-
gine : Fluids and Lubricants" or, MA-59,
"Cummins (5.0L V8D) Engine : Fluids and
Lubricants".Standard Oil
capacity: Refer to DLN-172, "General Specifica-
tion".



2. Install a gasket on filler plug, and install it to final drive assembly. CAUTION:

Do not reuse gasket.

3. Tighten filler plug to the specified torque. Refer to <u>DLN-159</u>, "Disassembly and Assembly".

REMOVAL AND INSTALLATION SIDE OIL SEAL

Removal and Installation

REMOVAL

- 1. Drain gear oil. Refer to <u>DLN-148, "Draining"</u>.
- 2. Remove the front drive shafts from front final drive assembly. Refer to FAX-16. "Removal and Installation".
- Remove the side oil seal using Tool (A) and Tool (B).
 CAUTION: Do not damage gear carrier.

ΤοοΙ	:	_	(J-02619-5)
Tool	:	_	(J-51870)



INSTALLATION

1.	Apply multi-purpose grease to the lips of the new side oil seal. Then install the new side oil seal evenly using suitable tool.	Н
	 Do not reuse side oil seal. Do not incline the new side oil seal when installing. Apply multi-purpose grease to the lips of the new side oil seal. 	
2.	Installation of the remaining components is in the reverse order of removal.	
	Check the front differential gear oil level after installation. Refer to <u>DLN-148, "Inspection"</u> .	J
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FRONT OIL SEAL

Removal and Installation

REMOVAL

- 1. Remove the front propeller shaft. Refer to <u>DLN-123, "Removal and Installation"</u>.
- Measure the total preload torque. Refer to <u>DLN-159</u>, "<u>Disassembly and Assembly</u>". NOTE:
 - Record the total preload torque measurement.
- 3. Check companion flange runout. Refer to DLN-159, "Disassembly and Assembly".
- 4. Remove the drive pinion lock nut using suitable tools (A) and (B).

CAUTION:

Do not reuse drive pinion lock nut.



5. Put matching mark (B) on the end of the drive pinion that aligns with mathcing mark (A) on companion flange (1). CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



6. Remove companion flange using suitable tool (A).





7. Remove the front oil seal using suitable tool (A).

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< REMOVAL AND INSTALLATION >

INSTALLATION

1. Apply multi-purpose grease to the lips of the new front oil seal. Then install front oil seal in evenly using Tool (A).

> Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.
- 2. Align the matching mark (B) of drive pinion with the matching mark (A) of companion flange (1), then install the companion flange.
- 3. Apply sealant to the threads of the drive pinion and seat of new drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion.
 - **CAUTION:**
 - Do not reuse drive pinion lock nut.
 - · Apply sealant to the threads of the drive pinion and seating surface of the new drive pinion lock nut.

NOTE:

Apply anti-corrosion oil to the spline of the drive pinion.

While holding companion flange with suitable tool (B), tighten 4 drive pinion lock nut to the specified torgue so as to keep the bearing preload within a standard values, check bearing preload using Tool (A).

> Tool number : ST3127S000 (—)

Total preload torque

: Refer to DLN-172, "Inspection and Adjustment".

Drive pinion lock nut tightening torque:

: Refer to DLN-159, "Exploded View".

CAUTION:

- · Adjust to the lower limit of the drive pinion lock nut tightening torque first.
- If the preload torgue exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.
- 5. Make a stamping for identification of front oil seal replacement frequency.

CAUTION:

Make a stamping after replacing front oil seal.

- 6. Install front propeller shaft. Refer to DLN-123, "Removal and Installation".
- Refill gear oil to the final drive. Refer to <u>DLN-148</u>, "<u>Refilling</u>".
- Check companion flange runout. Refer to DLN-159, "Disassembly and Assembly". 8.



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< REMOVAL AND INSTALLATION >

AIR BREATHER

INFOID:000000013189352



Removal and Installation: Cummins 5.0 L Models

REMOVAL

- 1. Remove wheel and tire (LH) using power tool. Refer to WT-69, "Removal and Installation".
- 2. Loosen hose clamp, and remove air breather hose A from final drive assembly.

Revision: March 2016

DLN-152

2016 Titan NAM

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AIR BREATHER

[FRONT FINAL DRIVE: MA235]



AIR BREATHER

< REMOVAL AND INSTALLATION >

• When inserting air breather hoses A and B to hose connector (1), be sure to insert it fully until its end reaches the stop. CAUTION:

Align paint marks (A) on each air breather hose A and B.



[FRONT FINAL DRIVE: MA235]

• When inserting air breather hose B to final drive assembly, be sure to insert it fully until its end reaches the stop.

CAUTION:

• Set hose clamp (1) at the end of air breather hose with dimension (A) from the hose edge.

Dimension (A) : 5 – 7 mm (0.20 – 0.28 in)

Removal and Installation: VK56VD Models

• When installing air breather hose, make sure there are no pinched or restricted areas on air breather hose caused by bending or winding.



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REMOVAL

- 1. Remove wheel and tire (LH) using power tool. Refer to WT-69, "Removal and Installation".
- 2. Loosen hose clamp, and remove air breather hose A from final drive assembly.
- 3. Remove clip A (1) from frame (2).





4. Remove clip B (1) from bracket (2) of frame.

AIR BREATHER

< REMOVAL AND INSTALLATION >

5. Remove clip C (1) from frame (2).

6. Remove clip D (1) from frame (2).

[FRONT FINAL DRIVE: MA235]



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7. Remove air breather hose assembly.

8. Separate air breather hose A and air breather hose B from hose connector.

INSTALLATION

Installation is in the reverse order of removal. **CAUTION:**

- Do not reuse clips.
- Do not reuse hose clamps.
- When inserting air breather hoses A and B to hose connector (1), be sure to insert it fully until its end reaches the stop. CAUTION:

Align paint marks (A) on each air breather hose A and B.



• When inserting air breather hose B to final drive assembly, be sure to insert it fully until its end reaches the stop.

CAUTION:

• Set hose clamp (1) at the end of air breather hose with dimension (A) from the hose edge.

Dimension (A) : 5 - 7 mm (0.20 - 0.28 in)

 When installing air breather hose, make sure there are no pinched or restricted areas on air breather hose caused by bending or winding.



Revision: March 2016

2016 Titan NAM

CARRIER COVER

Removal and Installation

REMOVAL

- 1. Drain differential gear oil. Refer to DLN-148, "Draining".
- 2. Remove the front final drive assembly. Refer to <u>DLN-157</u>, "Removal and Installation".
- 3. Remove the carrier cover bolts and separate the carrier cover from the gear carrier. **CAUTION:**
 - Do not damage the mating surface.
 - Do not insert flat-bladed screwdriver, this will damage the mating surface.
 - Do not reuse gasket

INSTALLATION

- 1. Install the carrier cover and gasket to the gear carrier. Tighten the bolts to the specified torque. Refer to <u>DLN-159, "Exploded View"</u>.
- 2. Install the front final drive assembly. Refer to <u>DLN-157, "Removal and Installation"</u>. CAUTION:

Do not reuse gasket.

3. Fill the front final drive assembly with recommended differential gear oil. Refer to DLN-148, "Refilling".

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[FRONT FINAL DRIVE: MA235]

[FRONT FINAL DRIVE: MA235]

UNIT REMOVAL AND INSTALLATION FRONT FINAL DRIVE

Exploded View

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REMOVAL

- 1. Remove the engine under cover. EXT-30, "ENGINE UNDER COVER : Removal and Installation".
- 2. Remove the drive shafts (LH/RH). Refer to FAX-16, "Removal and Installation".

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< UNIT REMOVAL AND INSTALLATION >

3. Remove bolts (A) and remove front cross member (1).

[FRONT FINAL DRIVE: MA235]



- 4. Remove the front propeller shaft. Refer to DLN-123, "Removal and Installation".
- Disconnect the breather hose from the front final drive assembly. Refer to <u>DLN-152</u>, "<u>Removal and Instal-lation</u>: <u>Cummins 5.0 L Models</u>" (Cummins 5.0L models) or, <u>DLN-154</u>, "<u>Removal and Installation</u>: <u>VK56VD Models</u>" (VK56VD models).
- 6. Support the front final drive assembly using a suitable jack.
- 7. Loosen front lower link bolts (A) enough to remove final drive assembly bolts (B).
 - (C) : Passenger side
 - (D) : Driver side



8. Remove the front final drive assembly bolts, then remove the front final drive assembly. **CAUTION:**

Support the front final drive assembly while removing using a suitable jack.

INSTALLATION

Installation is in the reverse order of removal.

- CAUTION:
- Make sure there are no pinched or restricted areas on the breather hose caused by folding or bending when installing it.
- Check the front final drive assembly fluid level and add the specified fluid as necessary. Refer to <u>DLN-148, "Inspection"</u>.

Inspection

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INSPECTION AFTER INSTALLATION

When oil leaks while removing/installing final drive assembly, check oil level after the installation. Refer to <u>DLN-148</u>, "Inspection".

DLN-158

< UNIT DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: MA235]

UNIT DISASSEMBLY AND ASSEMBLY FRONT FINAL DRIVE

Exploded View

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18.

21.

24.

Differential bearing cap bolts

Carrier cover bolts

Collapsible spacer

- 16. Differential assembly
- 19. Filler plug

1.

4.

7.

10.

13.

- 22. Carrier cover gasket
- 25. Needle bearing

Disassembly and Assembly

DISASSEMBLY

Differential Assembly

- 1. Drain the differential gear oil. Refer to <u>DLN-148, "Draining"</u>.
- 2. Remove side oil seals. Refer to DLN-149, "Removal and Installation".

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Revision: March 2016

DLN-159

Differential bearing cap

Pinion thrust washer

Carrier cover

Gear carrier

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< UNIT DISASSEMBLY AND ASSEMBLY >

3. Remove snap ring (1) from axle tube assembly.

[FRONT FINAL DRIVE: MA235]



4. Remove intermediate shaft using Tool (A) and Tool (B) as shown.

Tool (A)	: —	(J-26941)
Tool (B)	: —	(J-51870)



5. Remove the carrier cover bolts and separate the carrier cover from the gear carrier. **CAUTION:**

Do not reuse the gasket.

- 6. For proper reinstallation, paint matching marks (A) on one side of the side bearing cap and gear carrier. **CAUTION:**
 - · For matching marks, use paint. Do not damage side bearing cap or gear carrier.
 - · Side bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.





caps (A).

< UNIT DISASSEMBLY AND ASSEMBLY >

Lift the differential assembly (1) out of the gear carrier case (2).
 CAUTION:
 Keep side bearing outer races together with side bearing

Keep side bearing outer races together with side bearing inner races. Do not mix them up.

[FRONT FINAL DRIVE: MA235]



- Remove side bearing inner race (A) using suitable tool (B) and (C) as shown.
 CAUTION:
 - Do not remove side bearing inner race unless it is being replaced.
 - Place copper plates between the vise and the side bearing inner race and drive gear to prevent damage.
 - Engage puller jaws in groove to prevent damage to bearing.
 - Keep side bearing outer races together with side bearing inner races. Do not mix them up.
- For proper reinstallation, paint matching marks (A) on the differential case and drive gear.
 CAUTION:

Use paint for matching marks. Do not damage differential case or drive gear.

11. Remove the drive gear bolts (A).
 CAUTION:
 Drive gear bolts are left hand threaded.

12. Tap the drive gear off the differential case using suitable tool.
 CAUTION:
 Tap evenly all around to keep drive gear from bending.

Drive Pinion Disassembly

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< UNIT DISASSEMBLY AND ASSEMBLY >

1. Remove the drive pinion lock nut using suitable tool (A).

[FRONT FINAL DRIVE: MA235]



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Put matching mark (B) on the end of the drive pinion that aligns with matching mark (A) on the companion flange (1).
 CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.

Remove the companion flange using suitable tool (A).



Do not drop drive pinion assembly.

5. Remove the drive pinion rear bearing inner race and drive pinion height adjusting washer using suitable tool (A).

3.



< UNIT DISASSEMBLY AND ASSEMBLY >

6. Remove the front oil seal using suitable tool (A).

[FRONT FINAL DRIVE: MA235]



- 7. Remove the drive pinion front bearing inner race.
- Remove the drive pinion front bearing outer race using suitable tool (A) as shown. Locate the suitable tool on the back edge of the drive pinion front bearing outer race, then drive the drive pinion front bearing outer race out.
 CAUTION:

Do not damage gear carrier.

 Remove the drive pinion rear bearing outer race using suitable tools (A) and (B) as shown. Locate the suitable tool on the back edge of the drive pinion rear bearing outer race, then drive the drive pinion rear bearing outer race out.
 CAUTION:

Do not damage gear carrier.





INSULATOR BUSHINGS

 Fit Tool (A) onto insulator bushing to put mark (B) on carrier case in proper position for installation CAUTION:

Use paint to make the matching marks.

Tool set (A) : — (J-51879)



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< UNIT DISASSEMBLY AND ASSEMBLY >

- Install Tool (A) onto insulator bushing, install Tool (B) on the opposite side of insulator bushing and attach Tool (A) and Tool (B) using Tool (C).
- 3. Using Tools (A/B/C) press insulator bushing out.

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Tool set (A/B/C) : — (J-51879)
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[FRONT FINAL DRIVE: MA235]



INSPECTION AFTER DISASSEMBLY

Clean the disassembled parts. Then inspect the parts for wear or damage. If wear or damage are found, follow the measures below.

Drive Pinion and Drive Gear

- If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive pinion and drive gear.
- Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- · Bearing must be replaced with a new one whenever disassembled.

Side Gear and Pinion Mate Gear

- If any cracks or damage are found on the surface of the teeth, replace with new one.
- If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace with new one.
- Replace both side gear and pinion mate gear as a set when replacing side gear or pinion mate gear.

Side Gear Thrust Washer and Pinion Mate Thrust Washer

• If any chips (by friction), damage, or unusual wear are found, replace with new one.

Gear Carrier

• If any wear or cracks are found on the contact sides of gear carrier, replace with new one.

Companion Flange

• If any chips (about 0.1mm, 0.004 in) or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.

ASSEMBLY

Drive Pinion Assembly

1. Install drive pinion rear bearing outer race using Tool (A) and Tool (B).

Tool (A) : — (J-8092) Tool (B) : — (J-51869)



< UNIT DISASSEMBLY AND ASSEMBLY >

2. Install drive pinion front bearing outer race using suitable tool (A) and suitable tool (B).

[FRONT FINAL DRIVE: MA235]



- 3. Select drive pinion height adjusting washer.
- Install the selected drive pinion height adjusting washer (1) to the drive pinion. Press the drive pinion rear bearing inner race to it using suitable tool (A).
 CAUTION:

Do not reuse drive pinion rear bearing inner race.



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- Install the collapsible spacer to the drive pinion.
 CAUTION:
 Do not reuse collapsible spacer.
- 6. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly to the gear carrier.
- Apply differential gear oil to the drive pinion front bearing, and install the drive pinion front bearing inner race to the drive pinion assembly.
 CAUTION:

Do not reuse drive pinion front bearing inner race.

 Apply multi-purpose grease to the lips of the new front oil seal. Then drive the new front oil seal in evenly using Tools (A) and (B).

Tool (A)	: KV38100500	(J-25273)
Tool (B)	: —	(J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not angle the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.
- Install the companion flange to the drive pinion while aligning the matching marks. Tap the companion flange until fully seated using suitable tool.



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< UNIT DISASSEMBLY AND ASSEMBLY >

 Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut. Then adjust the drive pinion lock nut tightening torque using suitable tool (A), and check the drive pinion bearing preload torque using Tool (B).

Tool number (B): ST3127S000 (J-25765-A)

Drive pinion bearing preload torque:

Refer to DLN-172, "Inspection and Adjustment"

CAUTION:

- Do not reuse drive pinion lock nut.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque. Refer to <u>DLN-159</u>, "Disassembly and <u>Assembly"</u>.
- If the drive pinion bearing preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque.
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.
- 11. Check companion flange runout.
- 12. Install the differential case assembly.

Differential Assembly

1. Align the matching mark (A) of the differential assembly with the mark of the drive gear, then place the drive gear onto the differential case.



2. Install and tighten the new drive gear bolts (A) to the specified torque.

Bolt (A) : 185 N·m (19 kg-m,136 ft-lb)

CAUTION:

- Make sure the drive gear back and threaded holes are clean.
- Do not reuse drive gear bolts.
- Drive gear bolts are left hand threaded.
- Tighten new drive gear bolts in a criss-cross pattern.





[FRONT FINAL DRIVE: MA235]

< UNIT DISASSEMBLY AND ASSEMBLY >

3. Press the new side bearing inner races to the differential assembly using suitable tool (A) and suitable tool (B). **CAUTION:**

Do not reuse side bearing inner races.

4. Apply differential gear oil to the side bearings, and install the differential assembly (1) with the side bearing outer races into the gear carrier (2). **CAUTION:**

Do not reuse side bearing outer race when replacing side bearing inner race (replace as a set).

5. Insert side bearing adjusting washers (A) in place between side bearings and gear carrier.

6. Install the side bearing caps with the matching marks (A) aligned and hand tighten. NOTE: Do not torque caps at this step.

- 7. Check and adjust tooth contact, backlash, drive gear runout and total preload torque. Recheck above items. Refer to DLN-171, "Inspection".
- 8. Tighten side bearing cap bolts to the specified torque.

Torque : 110 N·m (11 kg-m,82 ft-lb)









[FRONT FINAL DRIVE: MA235]

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< UNIT DISASSEMBLY AND ASSEMBLY >

9. Install needle bearings using Tool (A) and Tool (B).

Tool (A)	1	_	(J-51868)
Tool (B)	:	_	(J-8092)



10. Apply multi-purpose grease to the lips of the new side oil seal. Then drive the new side oil seal in evenly to the gear carrier using suitable tool.

CAUTION:

- Do not reuse side oil seal.
- Do not incline the new side oil seal when installing.
- Apply multi-purpose grease to the lips of the new side oil seal.
- 11. Install the carrier cover and gasket to the gear carrier. Tighten the bolts to the specified torque.

Torque : 58 N·m (5.9 kg-m, 43 ft-lb)

INSULATOR BUSHINGS

1. Align Tool (D) and insulator bushing (A) to mark (E) on carrier case.

CAUTION:

Match alignment mark on Tool (D) to paint mark (E) for proper installation, alignment mark on Tool (D) must be within $\pm 2^\circ$ of paint mark (E).

- Install tool (B) on the opposite side of Bushing slot using Tool (C).
- 3. Press insulator bushing in using Tools (B/C/D).

Tool set (A/B/C/D/E) : — (J-51879)

ASSEMBLY INSPECTION AND ADJUSTMENT

- · Drain the differential gear oil before inspection and adjustment. Refer to DLN-148. "Draining".
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to <u>DLN-156</u>, <u>"Removal and Installation"</u>.

Total Preload Torque

1. Install the differential side shaft and differential side flange. CAUTION:

The differential side shaft and differential side flange must be installed in order to measure total preload torque.

- 2. Rotate the drive pinion back and forth two to three times to check for unusual noise and rotation malfunction.
- 3. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.



< UNIT DISASSEMBLY AND ASSEMBLY >

4. Measure total preload torque using Tool (A).

Tool : ST3127S000 (J-25765-A)

Total preload torque

: Refer to DLN-172, "Inspection and Adjustment"

NOTE:

Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque



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[FRONT FINAL DRIVE: MA235]

 If the measured value is out of the specification, check and adjust each part. Adjust the drive pinion bearing preload torque first, then adjust the side bearing preload torque.

If the total preload torque is	greater than specification	
On drive pinion bearings:	Replace the collapsible spacer.	
On side bearings:	Use thinner side bearing adjusting washers by the same amount to each side. For selecting adjusting washer refer to <u>DLN-172,</u> <u>"Inspection and Adjustment"</u> .	F
If the total preload torque is	less than specification	
On drive pinion bearings:	Tighten the drive pinion lock nut.	Н
On side bearings:	Use thicker side bearing adjusting washers by the same amount	

"Inspection and Adjustment".

to each side. For selecting adjusting washer, refer to DLN-172,

Tooth Contact

1. Apply red lead to the drive gear.

NOTE:

Apply red lead to both faces of all gears then check all gears.



 Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown.
 CAUTION:
 Check tooth contact on drive side and reverse side.



< UNIT DISASSEMBLY AND ASSEMBLY >

move drive pinion closer to the drive gear. Refer to DLN-172, "Inspection and Adjustment".

3. If the tooth contact is improperly adjusted, follow the procedure below to adjust the drive pinion height (dimension X).

[FRONT FINAL DRIVE: MA235]







• If the tooth contact is near the flank (flank contact), or near the toe (toe contact), use a thinner drive pinion height adjusting washer to move the drive pinion farther from the drive gear. Refer to DLN-172, "Inspection and Adjustment".

Backlash

1. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash:

Refer to DLN-172, "Inspection and Adjustment".



 If the backlash is outside of the specification, change the thickness of the side bearing adjusting washers.

If the backlash is greater than specification:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. For selecting adjusting washers, Refer to DLN-172, "Inspection and Adjustment".

< UNIT DISASSEMBLY AND ASSEMBLY >

If the backlash is less than specification:

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CAUTION: Do not change the total amount of washers as it will change the side bearing preload torque.

Companion Flange Runout

1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool.

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thinner by the same amount. For selecting adjusting washers,

Refer to DLN-172, "Inspection and Adjustment".

Runout limit	
Companion flange face:	Refer to <u>DLN-172</u>, "Inspection and Adjustment".
Companion	Refer to <u>DLN-172</u> , "Inspection and
flange inner side:	<u>Adjustment"</u> .

- flange inner side:
 Adjustment".

 If the runout is outside the runout limit, follow the procedure below to adjust.
- a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
- b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
- c. If the runout is still outside of the runout limit after repair of the assembly of drive pinion and drive pinion bearing or drive pinion bearing, replace the companion flange.

Inspection

2.

INSPECTION AFTER DISASSEMBLY

Side Shaft

• If it is chipped (by friction), cracked, damaged, or unusually worn, replace.

Bearing

- · Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

Oil Seal

- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace.

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SERVICE DATA AND SPECIFICATIONS (SDS)

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

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[FRONT FINAL DRIVE: MA235]

	4W	Ď	
Applied model	Cummins 5.0L	VK56VD	
	S, SL, SV	OR (PRO-4X)	
Final drive model	MA2	235	
Gear ratio	3.916	3.357	
Number of teeth (Drive gear/Drive pinion)	47/12	48/13	
Differential gear oil capacity (Approx.)	1.51 ℓ (3-1/4 US pt, 2-5/8 Imp pt)		
Number of pinion gears	2		
Drive pinion adjustment spacer type	Collap	sible	

Inspection and Adjustment

PRELOAD TORQUE

(Gear ratio:3.916 type)

Unit: N·m (kg-m, in-lb)

INFOID:000000012544425

Item	Standard
Drive pinion bearing preload torque	3.0 - 3.8 (0.31 - 0.39, 27 - 34)
Side bearing preload torque	1.2 - 2.3 (0.12 - 0.23, 11 - 20)
Total preload torque	4.2 - 6.1 (0.43 - 0.62, 37 - 54)

BACKLASH

Unit: mm (in)

Item	Standard
Drive gear to drive pinion backlash	0.13 - 0.23 (0.0051 - 0.009)

COMPANION FLANGE RUNOUT

	Unit: mm (in)
Item	Limit
Companion flange face	0.13 (0.0051)
Companion flange inner side	0.13 (0.0051)

SELECTIVE PARTS

Drive Pinion Height Adjusting Washers

< SERVICE DATA AND SPECIFICATIONS (SDS)

AND SPECIFICATIONS (SDS)							
	Uni	t: mm (in)					
Thickness	Package part number*	A					
0.5131 (0.0202)							
0.5395 (0.0212)							
0.5639 (0.0222)		P					
0.5893 (0.0232)		L					

0.5893 (0.0232)		D
0.6147 (0.0242)		
0.6401 (0.0252)		
0.6655 (0.0262)		С
0.6909 (0.0272)		
0.7163 (0.0282)	38154 E740B	
0.7417 (0.0292)	58154 EZ40B	
0.7671 (0.0302)		DL
0.7925 (0.0312)		
0.8179 (0.0322)		
0.8433 (0.0332)		_
0.8687 (0.0342)		
0.8941 (0.0352)		
0.9195 (0.0362)		
0.9449 (0.0372)		E

*: Always check with the Parts Department for the latest parts information.

Side Bearing Adjusting Washers

		Unit: mm (in)
Thickness	Package part number*	
5.5880 (0.2200)		
5.6134 (0.2210)		
5.6388 (0.2220)		
5.6642 (0.2230)		
5.6896 (0.2240)		
5.7150 (0.2250)		
5.7404 (0.2260)		
5.7658 (0.2270)		
5.7912 (0.2280)		
5.8166 (0.2290)		
5.8420 (0.2300)		
5.8674 (0.2310)		
5.8928 (0.2320)		
5.9182 (0.2330)		
5.9436 (0.2340)		
5.9690 (0.2350)		
5.9944 (0.2360)		
6.0198 (0.2370)		
6.0706 (0.2390)	20452 57405	
6.0960 (0.3581)	38453 EZ40B	
6.1214 (0.2410)		
6.1468 (0.2420)		
6.1722 (0.2430)		
6.1976 (0.2440)		
6.2230 (0.2450)		
6.2484 (0.2460)		
6.2738 (0.2470)		
6.2992 (0.2480)		
6.3246 (0.2490)		
6.3500 (0.2500)		
6.3754 (0.2510)		
6.4008 (0.2520)		
6.4262 (0.2530)		
6.4516 (0.2540)		
6.4770 (0.2550)		
6.5024 (0.2560)		
6.5278 (0.2570)		
6.5532 (0.2580)		

*: Always check with the Parts Department for the latest parts information.

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< PRECAUTION >

PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precaution for Servicing Rear Final Drive

INFOID:000000012544427

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

PREPARATION

Special Service Tool

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The actual shape of the tools may differ from those illustrated here.



[REAR FINAL DRIVE: MA248]

< PREPARATION >		[REAR FINAL DRIVE: MA248]
Tool number (TechMate No.) Tool name		Description
 (J-51045) Side bearing installer		Installing side bearing inner race a: 63.5 mm b: 39.6 mm
 (J-51046) Side bearing installer	A DIA03262Z	Installing side bearing inner race a: 63.5 mm b: 42 mm
— (J-44412) Pinion bearing driver	ALDIA0334ZZ	Installing drive pinion rear bearing inner race a: 52.2 mm b: 63.6 mm
 (J-51042) Shim installer	AWDIA10682Z	Installing side bearing adjusting shim a: 4.84 mm
 (J-51043) Axle housing spreader adapters	ALDIAO336ZZ	Removing differential case assembly
— (J-51048) Pinion axle installer	ALDIA03332Z	Installing companion flange
 (J-26941) Puller		Bearing/seal remover

[REAR FINAL DRIVE: MA248]



[REAR FINAL DRIVE: MA248]



NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING < SYSTEM DESCRIPTION > [REAR FINAL DRIVE: MA248]

SYSTEM DESCRIPTION

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

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Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		DLN-189	DLN-189	DLN-189	DLN-189	DLN-189	DLN-181	DLN-130	RAX-4	RSU-4	<u>WT-64</u>	<u>WT-64</u>	RAX-4	<u>BR-7</u>	<u>ST-32</u>	C
Possible cause and SUSPECT	ED PARTS	Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	REAR AXLE	REAR SUSPENSION	TIRES	ROAD WHEEL	AXLE SHAFT	BRAKES	STEERING	E F G
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	×	Н

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< SYSTEM DESCRIPTION >

DESCRIPTION

Cross-Sectional View

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- 1. Differential case
- 4. Drive pinion front bearing
- 7. Drive gear

- 2. Drive pinion
- 5. collapsible spacer
- 8. Differential side bearing
- 3. Companion flange
- 6. Drive pinion rear bearing
- 9. Side bearing adjusting shim
PERIODIC MAINTENANCE REAR DIFFERENTIAL GEAR OIL

Inspection

OIL LEAKAGE

- · Check that oil is not leaking from final drive assembly or around it.
- When oil leaking, drain all gear oil, and then fill with specified amount of gear oil. Refer to <u>DLN-181, "Drain-ing"</u>, <u>DLN-181, "Refilling"</u>.

CAUTION:

Oil volume cannot checked by oil level height. NOTE:

Oil is refilled up to filler plug hole.

OIL LEVEL

• Remove filler plug (1) and check oil level (A) from filler plug hole as shown.

CAUTION:

Do not start engine while checking oil level.

• Install filler plug and tighten to specification.

Filler plug torque : Refer to <u>DLN-189</u>, "Exploded <u>View"</u>.



[REAR FINAL DRIVE: MA248]

Draining

- 1. Stop engine.
- 2. Remove drain plug (1) and drain gear oil.
- 3. Install the drain plug and tighten to specification.

Drain plug torque : Refer to <u>DLN-189</u>, "Exploded <u>View"</u>.



Refilling

- Drain all gear oil. Refer to <u>DLN-181, "Draining"</u>. CAUTION: Drain gear oil until gear oil starts to drip.
- 2. Remove filler plug.
- 3. Fill with specified amount of gear oil (A).



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Oil grade and viscosity	: Refer to <u>MA-13, "VK56VD</u> <u>Gasoline Engine : Fluids</u> <u>and Lubricants", or MA-59,</u> <u>"Cummins (5.0L V8D) En-</u>
	gine : Fluids and Lubri- cants".
Oil capacity	: Refer to <u>MA-13, "VK56VD</u> <u>Gasoline Engine : Fluids</u> <u>and Lubricants"</u> or, <u>MA-59,</u> <u>"Cummins (5.0L V8D) En-</u> <u>gine : Fluids and Lubri-</u> <u>cants"</u> .

NOTE:

Oil is not refilled up to filler plug mounting hole. **CAUTION:**

Oil volume cannot checked by oil level height.

4. Install filler plug and tighten to specification.

Filler plug torque : Refer to <u>DLN-189, "Exploded</u> <u>View"</u>.

REMOVAL AND INSTALLATION FRONT OIL SEAL

REMOVAL

- 1. Drain the differential gear oil. Refer to <u>DLN-181, "Draining"</u>.
- Disconnect rear propeller shaft and support rear propeller shaft using suitable wire. Refer to <u>DLN-133</u>, <u>"Removal and Installation"</u>.
- 3. Remove the axle shaft assemblies (LH/RH). Refer to RAX-6. "Removal and Installation".
- Measure the total preload torque. Refer to <u>DLN-189</u>, "Disassembly and Assembly". NOTE:

Record the total preload torque measurement.

- 5. Remove the drive pinion nut using suitable tool (A). CAUTION:
 - Do not use power tool to remove drive pinion lock nut.
 - Do not reuse drive pinion lock nut or washer.



 Put matching marks (A) on the companion flange and drive pinion using paint.
 CAUTION:

7. Remove the companion flange using suitable tool (A).

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.





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< REMOVAL AND INSTALLATION >

 Remove the front oil seal using Tool (A).
 CAUTION: Do not reuse front oil seal.

Tool (A) : — (J-26941)



INSTALLATION

- 1. Clean the threads and splines of the drive pinion.
- 2. Apply multi-purpose grease to the lips of the new fron oil seal and drive the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips and differential gear oil to the circumference of the new front oil seal.



- 3. Apply spline sealant 1.5mm (0.059 in) diameter bead 360 degrees around splines inside of the companion flange and install it on the drive pinion, aligning the matching marks.
 - Use spline sealant (Loctite 565) or equivalent. Refer to <u>GI-22, "Recommended Chemical Products and Sealants"</u>.
- 4. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool number (A): — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.
- 5. Measure the total preload torque as necessary using Tool (B).
- a. Use the Pre-measured total preload torque recorded during removal and add an additional preload torque "A" to the recorded pre-measured value. Use this calculated value when adjusting the total preload torque "T", when not replacing the collapsible spacer.

B
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Pre-measured total preload torque + Additional torque "A" = Total preload torque "T"

Additional preload torque "A" Total preload torque "T" : Refer to <u>DLN-202, "Pre-</u> load Torque". : Refer to <u>DLN-202, "Pre-</u> load Torque".

 b. Tighten drive pinion lock nut in increments and measure total preload torque several times to prevent overtightening.
 CAUTION:

Do not loosen drive pinion lock nut to adjust the total preload torque. If the total preload torque exceeds the specifications, replace the collapsible spacer and the drive pinion front bearing. Then tighten it again to adjust. Refer to <u>DLN-189</u>, "<u>Disassembly and Assembly</u>".

FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

C.	Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the pinion bearings.	А
	After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rota- tion malfunction, and other malfunctions.	R
6.	Installation of the remaining components is in the reverse order of removal. CAUTION: Fill the rear final drive with new differential gear oil level after installation. Befor to DLN 181	D

Fill the rear final drive with new differential gear oil level after installation. Refer to <u>DLN-181</u>, <u>"Inspection"</u>.

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< REMOVAL AND INSTALLATION >

CARRIER COVER

Removal and Installation

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REMOVAL

- 1. Drain the differential gear oil. Refer to <u>DLN-181, "Draining"</u>.
- 2. Remove the rear stabilizer bar clamps and bushings and position rear stabilizer bar out of the way. Refer to <u>RSU-6. "Exploded View"</u>.
- 3. Disconnect the parking brake cable (A) and brake tube (B) from the carrier cover.



[REAR FINAL DRIVE: MA248]

- 4. Remove the carrier cover bolts and separate the carrier cover from the gear carrier. **CAUTION:**
 - Do not damage the mating surface.
 - Do not insert flat-bladed screwdriver, this will damage the mating surface.

INSTALLATION

 Apply medium strength thread locking sealant into the threaded holes for the carrier cover. Install dry carrier cover gasket and carrier cover and bracket and tighten carrier cover bolts to the specification. Refer to <u>DLN-189</u>, "Exploded View".

CAUTION:

- If carrier cover gasket is damaged replace it.
- Remove any moisture, oil, or foreign material adhering to the application and mating surfaces. NOTE:

Use Genuine Medium Strength Locking Sealant or equivalent. Refer to <u>GI-22, "Recommended Chemical</u> <u>Products and Sealants"</u>.

2. Connect the parking brake cable and brake tube to the carrier cover.

< UNIT REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248] UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE

Exploded View

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Removal and Installation

REMOVAL

CAUTION:

- Do not damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from final drive/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.
- Ρ Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft with suit-1. able wire. Refer to DLN-132, "Exploded View".
- 2. Disconnect the rear final drive air breather hose from the rear final drive assembly.
- Disconnect the following components from the rear final drive assembly. 3.
 - Brake tube block connectors. Refer to <u>BR-27, "REAR : Removal and Installation"</u>.
 - ABS sensor wire harness. Refer to <u>BRC-163</u>, "Removal and Installation".

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REAR FINAL DRIVE

< UNIT REMOVAL AND INSTALLATION >

- Parking brake cable (A).
- Brake tube (B).



- 4. Remove the rear stabilizer bar. Refer to <u>RSU-6, "Exploded View"</u>.
- 5. Support rear final drive assembly using a suitable jack. CAUTION:

Secure rear final drive assembly to jack while removing it.

- 6. Remove rear shock absorber lower bolts. Refer to RSU-10, "Removal and Installation".
- 7. Remove leaf spring U-bolt nuts. Refer to RSU-6. "Removal and Installation".
- 8. Remove rear final drive assembly. CAUTION:

Secure rear final drive assembly to the jack while removing it.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

 Check the rear final drive assembly differential gear oil after installation. Refer to <u>DLN-181, "Inspec-</u> <u>tion"</u>. Exploded View

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SEC. 380 1) 2 🗙 DLN 4 🗙 3 **X** T 62 6 🗙 21 🔽 79 (8.1, 58) @XT 19 ★ 7 32 (3.3, 24) 16 15 10 🗙 🔽 300 (31, 221) (13) 🕐 32 (3.3, 24) 12 🖸 39 (4.0, 29) AWDIA1499ZZ Companion flange assembly 2. Drive pinion lock nut washer 3.

- Drive pinion lock nut 1.
- 4. Front oil seal
- 7. Drain plug
- Ring gear bolts 10.
- 13. Filler plug
- 16. Side bearing adjusting shim RH 17.
- 19. Drive pinion washer 20.
- 22. Gear carrier

Revision: March 2016

Disassembly and Assembly

DISASSEMBLY NOTE: If disassembly is being done on-vehicle, perform the following prior to disassembly:

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Collapsible spacer

Carrier cover gasket

12. Carrier cover bolts

21. Bearing cap bolts

Side bearing adjusting shim LH

Drive pinion and drive gear assembly

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DLN-189

Drive pinion front bearing

Side bearing assembly LH

Side bearing assembly RH

Drive pinion read bearing

Differential assembly

Carrier cover

< UNIT DISASSEMBLY AND ASSEMBLY >

- Disconnect the propeller shaft from the rear final drive and support the propeller shaft using suitable tool. Refer to or <u>DLN-133</u>, "Removal and Installation".
- Remove the spare tire.

Differential Assembly

1. Remove the carrier cover bolts and carrier cover gasket. **NOTE:**

The carrier cover gasket is reusable. Only replace the carrier cover gasket if it is damaged. **CAUTION:**

- Do not damage the mating surface.
- Do not insert flat-bladed screwdriver, this will damage the mating surface.
- 2. For proper reinstallation, paint matching mark (1) on one side of side bearing cap.

CAUTION:

CAUTION:

- Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.
- For matching mark, use paint. Do not damage side bearing cap.





- 4. Remove differential case assembly.
- a. Attach Tool (A) to gear carrier.

Tool number (A): — (J-51043)

3. Remove side bearing caps using suitable tool (A).

Do not use power tool to remove side bearing caps.



b. Attach Tool (B) to Tool (A) and position Tool (C) in the proper orientation to measure the axle housing spread.

Tool number	(A) :		(J-51043)
	(B) :	—	(J-24385-C)
	(C):		(J-45101)

WARNING:

Be cautious when using Tool (A,B), the differential case assembly is heavy and could cause serious injury. CAUTION:

• Using a dial indicator (C) do not exceed a spread of 0.381mm (0.015 in) when using axle housing spreader.

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[REAR FINAL DRIVE: MA248]

< UNIT DISASSEMBLY AND ASSEMBLY >

- Remove Tool from gear carrier immediately after differential case removal, to avoid damage to gear carrier.
- Remove side bearing outer races and side bearing adjusting shims. Keep side bearing and outer races together. Do not mix them up. Also, keep side bearing adjusting shims together with bearings.
 CAUTION:

If reusing side bearing outer races and side bearing adjusting shims:

- Do not mix them up.
- Tag the side bearing outer races and the side bearing adjusting shims so they are installed in the same position they were removed from.
- 6. Remove side bearing using Tool (A) and suitable tool.

Tool (A) : — (J-51047)

CAUTION:

- Engage puller jaws in groove (+) to prevent damage.
- To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.
- Do not reuse side bearing if removed. Replace side bearing and bearing outer race as a set.

NOTE:

It is not necessary to remove side bearing except if it needs to be replaced.



Use paint for matching marks. Do not damage differential case or drive gear

8. Remove drive gear bolts.

Tool (A) : — (J-51044)

CAUTION:

- Secure the differential assembly in a vise using Tool (A).
- Drive gear bolts are left hand threaded.
- Do not damage drive gear by removing bolts improperly.



- 9. Tap the drive gear off the differential assembly uniformly using suitable tool. CAUTION:
 - Tap evenly all around to keep drive gear from binding.
 - Do not pry.
 - Do strike top of drive gear bolts to remove the drive gear.

NOTE:

Do not disassemble the differential assembly, it is not serviceable. Replace it as an assembly (if necessary).

Drive Pinion Assembly

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< UNIT DISASSEMBLY AND ASSEMBLY >

NOTE:

3.

- If assembly is being done on-vehicle, perform the following prior to after assembly:
- Install the propeller shaft to the rear final drive. Refer to DLN-133, "Removal and Installation".
- Install the spare tire.
- 1. Remove differential case assembly.

drive pinion using paint as shown.

companion flange or drive pinion.

2. Remove drive pinion lock nut and washer using suitable tool (A).





4. Remove companion flange and deflector using a suitable tool (A).

Put matching marks on the companion flange at location (A) and

Use paint to make the matching marks. Do not damage the

CAUTION:

CAUTION:

Do not damage companion flange or deflector.



5. Remove front oil seal using Tool (A).

Tool number : — (J-26941) CAUTION: Do not damage gear carrier.



6. Remove drive pinion front bearing thrust washer.

< UNIT DISASSEMBLY AND ASSEMBLY >

7. Remove drive pinion assembly (with rear inner bearing race and collapsible spacer) out of gear carrier using Tool (A). CAUTION:

Do not drop drive pinion assembly.

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Tool number (A) : — (J-44421)
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Do not reuse the collapsible spacer.

9. Remove drive pinion front bearing. CAUTION:

Do not reuse drive pinion front bearing.

10. Remove drive pinion rear bearing and drive pinion washer using suitable tool (A).

NOTE:

 The drive pinion washer is matched to the carrier for proper drive pinion height. No drive pinion height adjustment is necessary if reusing original drive pinion washer.

CAUTION:

- Do not reuse drive pinion rear bearing.
- Do not discard drive pinion washer, reuse if not damaged.



- 11. Clean threads and splines of the drive pinion, if reusing drive pinion.
- 12. Tap drive pinion front and rear bearing outer races uniformly using suitable tool (A) to remove. CAUTION:
 - Do not reuse bearing outer races. Replace bearing and outer races as a set.
 - · Do not damage gear carrier.



Clean and inspect the disassembled parts. If part are worn or damaged, follow the measures below.

Drive Pinion and Drive Gear

- If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust. repair, or replace as necessary.
- If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive pinion and drive gear.
- Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

Side Gear and Pinion Mate Gear





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< UNIT DISASSEMBLY AND ASSEMBLY >

- · If any cracks or damage are found on the surface of the teeth, replace case assembly.
- If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace case assembly.

Drive Pinion Washer

• If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT.

Side Bearing Adjusting Shim

 If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT.

Gear Carrier

• If any wear or cracks are found on the contact sides of gear carrier, replace with new one.

Companion Flange

• If any chips or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.

Differential Case Assembly

• If any wear or cracks are found on the case assembly, replace with new one.

ASSEMBLY

Drive Pinion Assembly

NOTE:

- If assembly is being done on-vehicle, perform the following after assembly:
- Connect the propeller shaft to the rear final drive. Refer to DLN-133, "Removal and Installation".
- · Install the spare tire.
- Install the new drive pinion front bearing outer race (2) and the new drive pinion rear bearing outer race (1), using Tools (A, B, C).

Tool (A): — (J-8092) (B): — (J-51040) (C): — (J-51041)

CAUTION:

Do not reuse drive pinion front and rear bearing outer race. Replace with bearing as a set.



< UNIT DISASSEMBLY AND ASSEMBLY >

2. Install the drive pinion washer (2) to the drive pinion (1). Press on the new drive pinion rear bearing (3) using Tool (A) and suitable tool.

> Tool (A): — (J-44412)

CAUTION:

- Install the drive pinion washer in the proper direction as shown.
- · Do not reuse drive pinion rear bearing.
- Be sure that drive pinion rear bearing is properly seated to the drive pinion.
- 3. Assemble the new collapsible spacer to the drive pinion. CAUTION:

Do not reuse collapsible spacer.

- 4. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly into the gear carrier.
- 5. Apply differential gear oil to the new drive pinion front bearing and install it onto the pinion assembly. CAUTION:

Do not reuse drive pinion front bearing.

- 6. Install the companion flange and washer onto the drive pinion.
- 7. Seat the drive pinion bearing using Tool.

Tool (J-51048)

If no Tool is available to seat the drive pinion bearing, perform the following.

a. Using the old washer and drive pinion lock nut, tighten the drive pinion lock nut using suitable tool (A) until the hand-felt lash has been removed.

CAUTION:

Do not use power tool to seat the drive pinion bearing.

b. Remove the drive pinion lock nut, washer and companion flange using suitable tools.





Tool number (J-50982)2.1

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- · Apply multi-purpose grease to the lips of the new front oil seal.





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< UNIT DISASSEMBLY AND ASSEMBLY >

9. Apply spline sealant 1.5 mm (0.059 in) diameter bead 360 degrees around splines inside of the pinion flange and install the companion flange to the drive pinion, aligning the matching marks.

CAUTION:

Do not damage companion flange, deflector or front oil seal.

NOTE:

Use Spline Sealant (Loctite 565) or equivalent. Refer to <u>GI-22</u>. "Recommended Chemical Products and Sealants".

10. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool : — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.
- 11. Adjust the drive pinion preload torque using Tool (B).

Tool

: — (J-25765-B)

Drive pinion bearing preload torque: Refer to <u>DLN-202, "Preload Torque"</u>

- a. Tighten drive pinion lock nut in small increments and measure drive pinion bearing preload torque several times to prevent overtightening.
- Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the drive pinion bearings.
 CAUTION:
 - Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque. If the drive pinion bearing preload torque exceeds specification, disassemble and
 - replace the collapsible spacer and the drive pinion front bearing. Then tighten it again to adjust. Refer to <u>DLN-189</u>, "Exploded View".
 - After adjustment, rotate drive pinion back and forth two to three times to check for unusual noise, rotation malfunction, and other malfunctions.
- 12. Check companion flange runout. Refer to DLN-189, "Disassembly and Assembly".
- 13. Install differential case assembly. Refer to DLN-189, "Disassembly and Assembly".

Differential Assembly

NOTE:

Do not disassemble differential assembly, it is not serviceable. Replace it as an assembly.

1. Secure the differential assembly in a vice using Tool (A)

Tool : — (J-51044)

2. Apply thread locking sealant the point (A) into the thread hole for the drive gear (1).





[REAR FINAL DRIVE: MA248]

< UNIT DISASSEMBLY AND ASSEMBLY >

Use Genuine High Strength thread locking Sealant or equivalent. Refer to <u>GI-22</u>, "<u>Recommended Chemical Products and</u> <u>Sealants</u>".

CAUTION:

- Completely clean and degrease the drive gear back face, thread holes.
- Apply thread locking sealant onto the first and second threads under the thread hole chamfering of the drive gear on three or more different points.
- Use genuine high strength thread locking sealant or equivalent. Refer to <u>GI-22, "Recommended Chemical Products and Sealants"</u>.
- Align the matching mark of the differential case with the mark of the drive gear (if reusing drive gear), then hand thread all the drive gear bolts to the drive gear.
 CAUTION:
 - Drive gear bolts are left hand threaded.
 - Do not reuse drive gear bolts.



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- 4. Draw the gear onto the differential assembly by tightening drive gear in a crisscross pattern. **CAUTION:**
 - Do not use power tool to tighten drive gear bolts
 - Drive gear bolts are left hand threaded.
- 5. Tighten the drive gear bolts to specification:

Drive gear torque	
specification	

: Refer to <u>DLN-189,</u> "Exploded View".

CAUTION:

- Do not reuse drive gear bolts.
- Tighten drive gear bolts in a crisscross pattern.
- Drive gear bolts are left hand threaded.
- Press the new side bearings (1) onto the differential assembly (2) using Tool (A) and Tool (B).

Tool (A): — (J-51045 or J-51046) (B): — (J-51047)

CAUTION:

Do not reuse side bearing inner race if removed. Be sure that the side bearings are properly seated onto the differential assembly.



< UNIT DISASSEMBLY AND ASSEMBLY >

7. If Tool was removed after disassembly reinstall Tools (A, B, C).

Tool number (A): — (J-51043) (B): — (J-24385-C) (C): — (J-45101)



8. Apply gear oil to side bearings. Install differential assembly with side bearing outer races into gear carrier.

9. Insert the left and right side bearing adjusting shims (2) in place between the side bearing outer race (3) and gear carrier (1) using Tool (A).

Tool (A): — (J-51042)

CAUTION:

- Install the side bearing adjusting shims in the proper direction as shown.
- Do not strike the side bearing adjusting shims with a hammer.

NOTE:

Use axle housing spreader tool if necessary.

10. Install the side bearing caps with the matching marks aligned and tighten the side bearing cap bolts to specification.

Side bearing cap bolt torque specification: Refer to <u>DLN-189, "Exploded View"</u>

CAUTION:

Tighten side bearing cap bolts in a crisscross pattern.



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- 11. Check and adjust backlash, tooth contact and total preload torque. Refer to <u>DLN-189</u>, "Disassembly and <u>Assembly</u>".
- 12. Install the carrier cover and gasket to the gear carrier. Refer to DLN-186, "Removal and Installation".

INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to DLN-181, "Draining".
- Remove axle shaft assemblies (LH/RH) before inspection and adjustment. Refer to <u>RAX-6, "Removal and</u> <u>Installation"</u>.
- Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft with suitable wire. Refer to <u>DLN-132</u>, "Exploded View".

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< UNIT DISASSEMBLY AND ASSEMBLY >

• Remove and install the carrier cover as necessary for inspection and adjustment. Refer to <u>DLN-186.</u> "Removal and Installation".

Total Preload Torque

- 1. Rotate the drive pinion back and forth two to three times to check for unusual noise and rotation malfunction.
- 2. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.
- 3. Measure total preload torque using Tool (A).

Total preload torque

: Refer to <u>DLN-202, "Pre-</u> load Torque".

NOTE:

Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque.

- If the measured value is greater than specification, adjust as necessary.
- Adjust the drive pinion bearing preload torque first, then adjust the total preload torque by selecting side bearing adjusting shims.
- The differential gear case assembly must be removed to adjust the drive pinion bearing preload.

Tool : ST3127S000 (J-25765-B)

If the total preload torque is	greater than specification	
On drive pinion bearings	: Replace collapsible spacer.	
On side bearings	: Use thinner side bearing adjusting washers by the same amount on each side. Refer to <u>DLN-189, "Exploded</u> <u>View"</u> .	
If the total preload torque is	less than specification	
On drive pinion bearings	: Tighten drive pinion lock nut.	
On side bearings	: Use thicker side bearing adjusting washers by the same amount on each side. Refer to <u>DLN-189, "Exploded</u> View".	

Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

- 1. Thoroughly clean drive gear and drive pinion teeth.
- 2. Apply red lead to the drive gear.
 - Apply red lead to both faces of all gears then check all gears.





[REAR FINAL DRIVE: MA248]

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< UNIT DISASSEMBLY AND ASSEMBLY >

 Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown.
 CAUTION:

Check tooth contact on drive side and reverse side.



X mm (in)

Drive

(Heel contact)

surface

(Face contact)

Drive

surface

SDIA0517E

PDIA0440E

4. If the tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).

 If the tooth contact is near the face (face contact), or near the heel (heel contact), use a thicker drive pinion height adjusting washers to move the drive pinion closer to the drive gear. Refer to <u>DLN-189</u>, "Exploded View".

 If the tooth contact is near the flank (flank contact), or near the toe (toe contact), use a thinner drive pinion height adjusting washers to move the drive pinion farther from the drive gear. Refer to <u>DLN-189</u>, "Exploded View".



Backlash

< UNIT DISASSEMBLY AND ASSEMBLY >

1. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash : Refer to DLN-202, "Backlash".

• If the backlash is outside of the specification, change the thickness of each side bearing adjusting shim.



[REAR FINAL DRIVE: MA248]

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If the total preload torque is	greater than specification	
On drive pinion bearings	: Replace collapsible spacer.	E
On side bearings	: Use thinner side bearing adjusting washers by the same amount on each side. Refer to <u>DLN-189, "Exploded</u> <u>View"</u> .	F
If the total preload torque is	less than specification	G
On drive pinion bearings	: Tighten drive pinion lock nut.	
On side bearings	: Use thicker side bearing adjusting washers by the same amount on each side. Refer to <u>DLN-189, "Exploded</u>	H
	<u>View"</u> .	1

CAUTION:

Do not change the total thickness of side bearing adjusting shims as it will change the total preload torque.

Companion Flange Runout

1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool.

Runout limit

: Refer to DLN-203, "Companion Flange Runout"

- 2. If the runout is outside the runout limit, follow the procedure below to adjust.
- a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
- b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
- c. If the runout is still outside of the runout limit after replacing the companion flange. Replace the rear final drive assembly. Refer to <u>DLN-187</u>, "Removal and Installation".





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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: MA248]

SERVICE DATA AND SPECIFICATIONS (SDS) SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000012544438

Applied model	2WD, 4WD		
Applied model	VK56VD	Cummins 5.0L	
Vehicle grade	S, SL, SV		
Final drive model	MA	248	
Gear ratio	3.357	3.916	
Number of pinion gears		4	
Number of teeth (Drive gear / drive pinion)	47/14	47/12	
Oil capacity (Approx.)	2.6 ℓ (5-1/2 US	5 pt, 4-5/8 lmp pt)	
Drive pinion adjustment spacer type	Colla	psible	

Preload Torque

INFOID:000000013407862

PRELOAD TORQUE - REMOVAL AND INSTALLATION [WITHOUT REPLACING COLLAPSIBLE SPACER]

	Unit: N·m (kg-m, in-lb)
Item	Standard
Pre-measured total preload torque [measured before removal of drive pinion lock nut] Maximum	6.47 (0.66, 57)
Additional preload torque "A" [add to pre-measured total preload torque during installation of new drive pinion lock nut]	0.35 - 0.58 (0.03 - 0.06, 3 - 5)
Total preload torque "T" [after installation of new drive pinion lock nut] = pre-measured total preload torque + additional preload torque	4.05 - 6.82 (0.40 - 0.68, 35 - 59)

PRELOAD TORQUE - DISASSEMBLY AND ASSEMBLY [REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg-m, in-lb)

Item	Standard
Drive pinion bearing preload torque	3.12 - 4.42 (0.32 - 0.45, 28 - 39)
Side bearing preload torque (reference value = total preload torque - drive pinion bearing preload torque)	0.50 - 1.70 (0.05 - 0.17, 4 - 15)
Total preload torque (total preload torque = drive pin- ion bearing preload torque + side bearing preload torque)	3.62 - 6.12 (0.37 - 0.62, 32 - 54)

Backlash

Unit: mm (in)

INFOID:000000013407863

Item	Standard
Drive gear to drive pinion gear	0.152 - 0.245 (0.0060 - 0.0096)

SERVICE DATA AND SPECIFICATIONS (SDS) ID SPECIFICATIONS (SDS) [REAR FINAL DRIVE: MA248]

< SERVICE DATA AND SPECIFICATIONS (SDS)

Companion Flange Runout

INFOID:000000013407865

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Unit: mm (in)

Item	Limit	_
Companion flange face	0.12 (0.0051) or less	
Companion flange inner side 0.13 (0.0051) or less		

SELECTIVE PARTS

Drive Pinion Washer

	Unit: mm (in)
Thickness	Part number*
1.09 - 1.52	38154 EZ40A

*: Always check with the Parts Department for the latest parts information.

Side Bearing Adjusting Washer

	Unit: mm (in)	_
Thickness	Part number*	
5.59 - 6.52	38453 EZ40A	

*: Always check with the Parts Department for the latest parts information.

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< PRECAUTION > PRECAUTION PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precaution

 Before connecting or disconnecting differential lock control unit harness connector, turn ignition switch "OFF" and disconnect the battery cable from the negative terminal. Because battery voltage is applied to differential lock control unit even if ignition switch is turned "OFF".



INFOID:000000012544494

• When connecting or disconnecting pin connectors into or from differential lock control unit, take care not to damage pin terminals (bend or break).

When connecting pin connectors make sure that there are not any bends or breaks on differential lock control unit pin terminal.



PRECAUTIONS

< PRECAUTION >

 Before replacing differential lock control unit, perform differential lock control unit input/output signal inspection and make sure whether differential lock control unit functions properly or not. Refer to <u>DLN-218</u>, "<u>Reference Value</u>".



Precaution for Servicing Rear Final Drive

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- · Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

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PREPARATION

Special Service Tool

INFOID:000000013407868

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name		Description
— (J-50982) Pinion seal installer	ALDIA0324ZZ	Installing front oil seal a: 95.1 mm b: 55.43 mm
 (J-44421) Pinion Driver	ALDIA0325ZZ	Removing pinion gear from carrier
 (J-8092) Driver handle	S-NT090	Installing bearing outer race (Use with J-51041, J-51040))
 (J-51041) Outer pinion race installer	b ALDIA032822	Installing drive pinion front bearing outer race a. 80 mm b. 20.1 mm c: 62.9 mm
 (J-51040) Inner pinion race installer	a b ALDIA0330ZZ	Installing drive pinion rear bearing outer race a: 103.35 mm b: 24.7 mm c: 78.5 mm
 (J-51047) Side bearing remover pilot	a b c ALDIA03292Z	Removing and Installing side bearing in- ner race a: 41.8 mm b: 39.3 mm c: 50.8 mm

[REAR FINAL DRIVE: MA248 (ELD)]

PREPARATION >	[F	(EAR FINAL DRIVE: MA248 (ELD)]
Tool number (TechMate No.) Tool name		Description
 (J-51045) Side bearing installer	a	Installing side bearing inner race a: 63.5 mm b: 39.6 mm
 (J-51046) Side bearing installer	a Contraction of the second se	Installing side bearing inner race a: 63.5 mm b: 42 mm
 J-44412) Pinion bearing driver	ALDIA032622	Installing drive pinion rear bearing inner race a: 52.2 mm b: 63.6 mm
 J-51042) Shim installer	ALDIA033422	Installing side bearing adjusting shim a: 4.84 mm
 (J-51043) Axle housing spreader adapters		Removing differential case assembly
 (J-51048) Pinion axle installer		Installing companion flange
 (J-26941) Puller	ALDIA033322	Bearing/seal remover

[REAR FINAL DRIVE: MA248 (ELD)]



Commercial Service Tool

INFOID:000000013407869

Tool name		Description
Power tool		Loosening nuts, screws and bolts
	PIIB1407E	
(OTC-1123) Puller	ZAO700D	Bearing split plate

[REAR FINAL DRIVE: MA248 (ELD)]

Tool name		Description
(J-8433) Puller set		Removing side bearing inner race
lange wrench	H ALDIA031722	Removing and installing drive pinion lock nut
 EN-48702) ocket	NT035	Removing companion flange • 36 mm
	ALDIA0368ZZ	Measuring Tool
Dial indicator set		
	AWDIA10662Z	

< PREPARATION >

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

SYSTEM DESCRIPTION DIFFERENTIAL LOCK SYSTEM

Cross-Sectional View

INFOID:000000012544441



- 1. Differential lock solenoid
- 4. Companion flange

System Description

- 7. Drive pinion rear bearing
- 10. Side bearing adjusting shim
- 2. Differential lock position switch
- 5. Drive pinion front bearing
- 8. Drive gear
- 11. Differential case

- 3. Drive pinion
- 6. Collapsible spacer
- 9. Differential side bearing

INFOID:000000013476193

- Differential lock system is a device that locks differential function and facilitates emergency escaping of the vehicle when being stuck on a rough road, muddy road, deep snowy road, or when driving is impossible due to one-sided wheel spin.
- Lock/unlock of rear differential is switched according to operation of differential lock mode switch.
- Fail-safe function deactivates differential lock system when the system is malfunctioning. Refer to <u>DLN-220</u>, <u>"Fail-Safe"</u>.

DLN-210

DIFFERENTIAL LOCK SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM DIAGRAM



Signal with Communication Line Major signal transmission between each unit via CAN communication lines are shown in the following table.

Component parts	Signal item
Combination meter	Mainly receives the following signal from differential lock control unit via CAN commu- nication: • Differential lock indicator lamp signal
ABS actuator and electric unit (control unit)	 Mainly transmits the following signals to differential lock control unit via CAN communication: Each wheel speed signal ABS operation signal VDC operation signal ABS malfunction signal VDC malfunction signal
ECM	Mainly transmits the following signal to differential lock control unit via CAN communi- cation: • Engine speed signal
Transfer control unit	Mainly transmits the following signal to differential lock control unit via CAN communication:4WD mode signal

CONDITION FOR OPERATE DIFFERENTIAL LOCK

					M
Differential lock mode switch	4WD mode	ABS or VDC operation	Vehicle speed	Differential lock opera- tion	
ON	2WD	—	—	OFF	Ν
	4H	—	—	OFF	
	41	055*	7 km/h (4 MPH) or more	OFF	
	4L	OFF	7 km/h (4 MPH) or less	ON	0

*: VDC function is not operate when 4WD mode is "4L".

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DIFFERENTIAL LOCK SYSTEM

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MA248 (ELD)]

Component Parts Location

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- A. Rear differential area
- B. Rear differential area
- D. Rear passenger compartment (view with rear trim panel removed)

C. Differential lock mode switch (view of switch removed from vehicle)

Differential lock solenoid controls pressure plate according to signal

from differential lock control unit.

DIFFERENTIAL LOCK SYSTEM

cation.

[REAR FINAL DRIVE: MA248 (ELD)]

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	For detailed installation location, refer to <u>EC-34, "Component Parts Location"</u> (CUM- MINS 5.0L) or <u>EC-1269, "Component Parts Location"</u> (VK56VD)	С
ABS actuator and electric unit (control unit)	 Mainly transmits the following signal to differential lock control unit via CAN communication. Each wheel speed signal ABS operation signal VDC operation signal ABS malfunction signal ABS malfunction signal For detailed installation location, refer to <u>BRC-9. "Component Parts Location"</u>. 	DLN
Transfer control unit	 Mainly transmits the following signal to differential lock control unit via CAN communication. 4WD mode signal For detailed installation location, refer to <u>DLN-212. "Component Parts Location"</u>. 	F
Combination meter	Illuminates DIFF LOCK indicator to indicate the differential lock is locked or in standby condition. Refer to <u>MWI-11, "METER SYSTEM : Design"</u> .	G
Differential lock solenoid	Refer to DLN-213, "Differential Lock Solenoid".	Ц
Differential lock position switch	Detects differential lock/unlock condition based on the position of the pressure plate.	11
Differential lock mode switch	Allows driver input for differential LOCK/UNLOCK to the differential lock control unit.	
Differential lock control unit	 Controls differential lock solenoid to lock/unlock the differential. As a fail-safe function, the differential lock disengages when a malfunction is detected within the differential lock system. For detailed installation location, refer to <u>DLN-212</u>. "Component Parts Location". 	
ential Lock Control Unit		J

Function

Mainly transmits the following signal to differential lock control unit via CAN communi-

Differential Lock Control Unit

Differential Lock Solenoid

< SYSTEM DESCRIPTION > **Component Description**

- - - - -

Component

No.

1.

2.

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8.

- Differential lock control unit, according to signal from differential lock mode switch, controls differential lock solenoid and switches status of rear differential (lock/unlock).
- · Fail-safe mode is available if malfunction is detected in differential lock system. For fail-safe, refer to DLN-220, "Fail-Safe".





DLN-213

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< SYSTEM DESCRIPTION >

Differential Lock Position Switch

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Differential lock position switch detects status of rear differential (lock/unlock) according to the position of pressure plate and transmits signal to differential lock control unit.



[REAR FINAL DRIVE: MA248 (ELD)]

Differential Lock Mode Switch

Differential lock mode switch activates or deactivates differential lock system according to switch position.



DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

[REAR FINAL DRIVE: MA248 (ELD)]

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INFOID:000000013478001

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

CONSULT Function

APPLICATION ITEMS

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Diagnostic te	est mode	Function	С
ECU Identification		Differential lock control unit part number can be read.	
Self Diagnostic Re	sult	Self-diagnostic results and freeze frame data can be read and erased quickly.*	
Data Monitor		Input/Output data in the differential lock control unit can be read.	DLI
*: The following	diagnosis info	ormation is erased by erasing:	
DTC Freeze frame (data (FED)		Е
Differential lock	CATION	art number can be read	_
			F
Refer to DLN-22	0. "DTC Inde		
			G
• The system is	presently ma	Ifunctioning.	
When "DAST" is di	nloved on celf	diagnosis result	
System malfur	nction in the p	bast is detected, but the system is presently normal.	Н
FREEZE FRAME	DATA (FFD)		
The following ve	hicle status i	s recorded when DTC is detected and is displayed on CONSULT.	
Itom namo		Dienlov itom	
	 The number o When "0" is 	t times that ignition switch is turned ON after the DTC is detected is displayed. displayed: It indicates that the system is presently malfunctioning.	J
	When except	ot "0" is displayed: It indicates that system malfunction in the past is detected, but the system is pres-	
IGN COUNTER (0 – 39)	ently norma	l.	K
(0 00)	Each time w	when ignition switch is turned OFF to ON, numerical number increases in $1\rightarrow 2\rightarrow 338\rightarrow 39$.	
	When the o	peration number of times exceeds 39, the number do not increase and "39" is displayed until self- erased	
	diagnosis is	erased.	I

DATA MONITOR NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable M to this vehicle, refer to CONSULT display items.

Monitor item (Unit)	Remarks	N
CONT MODUL VOLT (V)	Power supply voltage for differential lock control unit is displayed.	- 11
SOLENOID VOLT (V)	Power supply voltage for differential lock solenoid is displayed.	_
4WD MODE (2H/4H/4Lo)	4WD shift switch status is displayed.	0
INDICATOR (On/Off/FLASH)	Control status of differential lock indicator lamp is displayed.	_
D-LOCK SW SIG (On/Off)	Differential lock mode switch position is displayed.	_
D-LOCK PERMIT SIGNAL (On/Off)	Differential lock operation permission by differential lock control unit is displayed.	- P
D-LOCK POS SW (On/Off)	Condition of differential lock position switch is displayed.	_
BUZ SIG (On/Off)	Buzzer is not equipped, but it is displayed.	_
SOLENOID DRIVE MONITOR (On/Off)	Monitored driving status of differential lock solenoid is displayed.	_
FAIL-SAFE RELAY SIGNAL (On/Off)	Signal state for operating the fail-safe relay is displayed.	_
WHEEL SPD SEN RR (km/h or mph)	Wheel speed calculated by rear RH wheel sensor signal is displayed.	_

Revision: March 2016

DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

< SYSTEM DESCRIPTION >

[REAR FINAL DRIVE: MÁ248 (ELD)]

Monitor item (Unit)	Remarks
WHEEL SPD SEN RL (km/h or mph)	Wheel speed calculated by rear LH wheel sensor signal is displayed.
VHCL/S SEN-RR (km/h or mph)	Average of rear wheel sensors (left and right is displayed.
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING < SYSTEM DESCRIPTION > [REAR FINAL DRIVE: MA248 (ELD)]

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

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Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		DLN-292	DLN-292	DLN-292	DLN-292	DLN-292	DLN-306	DLN-130	RAX-4	RSU-4	<u>WT-64</u>	<u>WT-64</u>	RAX-4	<u>BR-7</u>	<u>ST-32</u>	С
						runout										DLN
			L			cessive										
Possible cause and SUSPECT	ED PARTS	db	npropei	worn	rect	nge exc	ber	SHAFT		NOISN						E
		oth rou	intact ir	urfaces	h incor	nion fla	improp	ILLER (AXLE	SUSPE		NHEEL	HAFT	S	NG	F
		Gear to	Gear co	Tooth su	Backlas	Compar	Gear oil	PROPE	REAR /	REAR S	TIRES	ROAD \	AXLE S	BRAKE	STEER	
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	х	G

×: Applicable

ECU DIAGNOSIS INFORMATION DIFFERENTIAL LOCK CONTROL UNIT

Reference Value

INFOID:000000013478002

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items:

Monitor item		Condition	Value/Status
CONT MODUL VOLT	Ignition switch: ON		Battery voltage
SOLENOID VOLT	Ignition switch: ON		Battery voltage
	4WD shift switch: 2H		2H
4WD MODE	4WD shift switch: 4H		4H
	4WD shift switch: 4L		4L
	Differential lock indicator	lamp: ON	On
INDICATOR	Differential lock indicator	lamp: OFF	Off
	Differential lock indicator	lamp: Flash	FLASH
	Differential lock mode sw	itch: ON	On
D-LOCK SW SIG	Differential lock mode sw	itch: OFF	Off
	Differential lock mode sw	itch: OFF	Off
		4WD shift switch: Except 4L	Off
D-LOCK PERMIT SIGNAL	Differential lock mode	 4WD shift switch: 4L Vehicle speed above 7 km/h (4 MPH)	Off
		 4WD shift switch: 4L Vehicle speed below 7 km/h (4 MPH)	On
	Differential lock system: I	_ock mode	On
D-LOCK POS SW	Differential lock system: l	Jnlock mode	Off
	Differential lock standby	condition	Off
BUZ SIG	Always		Off
	Differential lock mode sw	itch: OFF	Off
		4WD shift switch: Except 4L	Off
SOLENOID DRIVE MONITOR	Differential lock mode	 4WD shift switch: 4L Vehicle speed above 7 km/h (4 MPH)	Off
		 4WD shift switch: 4L Vehicle speed below 7 km/h (4 MPH)	On
	Differential lock system: I	n fail-safe mode	On
FAIL-SAFE RELAY SIGNAL	Differential lock system: I	Not malfunction	Off
	Vehicle stopped		0.00 km/h (0.00 mph)
WHEEL SPD SEN RR	Vehicle running (in straig CAUTION: Check air pressure of ti	ht-ahead driving) re under standard condition.	Nearly matches the speed meter display (±10% or less)
	Vehicle stopped		0.00 km/h (0.00 mph)
WHEEL SPD SEN RL	Vehicle running (in straig CAUTION: Check air pressure of ti	ht-ahead driving) re under standard condition.	Nearly matches the speed meter display (±10%)

DIFFERENTIAL LOCK CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[REAR FINAL DRIVE: MA248 (ELD)]

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Monitor item	Condition	Value/Status	
	Vehicle stopped	0.00 km/h (0.00 mph)	A
VHCL/S SEN-RR	Vehicle running CAUTION: Check air pressure of tire under standard condition.	Nearly matches the speed meter display (±10%)	B

TERMINAL LAYOUT



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PHYSICAL VALUES

Termi (Wire	nal No. color)	Description	I		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		Condition	Value (Approx.)
1	Ground	Differential lock so-	Output	lanition switch: ON	Differential lock mode switch: ON	Battery voltage
(Y)	Ground	lenoid (+)	Output	Ignition switch. ON	Differential lock mode switch: OFF	0 V
2	Cround	Differential lock so-	Input	lapition switch: ON	Differential lock mode switch: ON	0 V
(V)	Ground	lenoid (-)	mput	Ignition switch. ON	Differential lock mode switch: OFF	Battery voltage
5	Ground	Differential lock	Input	lanition switch: ON	Differential lock mode switch: ON	Battery voltage
(G/O)	Ground	mode switch (ON)	mput	Ignition switch. ON	Differential lock mode switch: OFF	0 V
7	Ground	lanition signal	Input	Ignition switch: ON		Battery voltage
(P)	Ground	Ignition signal	mput	Ignition switch: OFF		0 V
8 (L)	_	CAN-high	Input/ Output		_	_
9 (BR)	Ground	Power supply for solenoid	Input		Always	Battery voltage
10 (B)	Ground	Ground	—		Always	0 V
11 (B)	Ground	Ground	_		Always	0 V
					Differential lock system: Lock mode (Differential lock indicator lamp: ON)	0 V
12 (L)	Ground	Differential lock po- sition switch	Input	Ignition switch: ON	Differential lock system: Unlock mode (Differential lock indicator lamp: OFF)	Battery voltage
					Differential lock standby condition (Differential lock indicator lamp: Flash)	Battery voltage
14	Cround	Differential lock	المحصا	Ignition quitable ON	Differential lock mode switch: ON	0 V
(O)	Ground	mode switch (OFF)	input	Ignition switch: ON	Differential lock mode switch: OFF	Battery voltage
15 (Y/R)	Ground	Power supply for control unit (back-up)	Input		Always	Battery voltage
16 (R)	—	CAN-low	Input/ Output		_	_

CAUTION:

< ECU DIAGNOSIS INFORMATION >

When using circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

Fail-Safe

INFOID:000000013478003

If any malfunction occurs in differential lock system, and control unit detects the malfunction, differential lock control unit controls becomes the fail-safe mode depending on DTC.

DTC	Vehicle condition
Except the following DTC	Rear differential lock is disengaged.
•P1856 •P18D0 •P18CD	No impact to vehicle behavior. (Differential lock system can operate.)

DTC Inspection Priority Chart

INFOID:000000013478004

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	Detected items (DTC)
1	U1000 CAN COMM CIRCUIT U1010 CONTROL UNIT (CAN)
2	Other than the above

DTC Index

INFOID:000000013478005

DTC	Display Item	Reference
P1836	CONTROL UNIT 3	DLN-242, "DTC Description"
P1838	ON SW	DLN-243, "DTC Description"
P1839	POSI SW ON	DLN-246. "DTC Description"
P1844	RELAY	DLN-249, "DTC Description"
P1848	SOL DISCONNECT	DLN-250, "DTC Description"
P1849	SOL SHORT	DLN-254, "DTC Description"
P1850	SOL CURRENT	DLN-258, "DTC Description"
P1856	VDC SYSTEM	DLN-260, "DTC Description"
P18CB	SOLENOID POWER SUPPLY	DLN-261, "DTC Description"
P18CC	WHEEL SPEED SIGNAL	DLN-264, "DTC Description"
P18CD	INCOMPLETE SELF SHUTDOWN	DLN-265, "DTC Description"
P18CE	DIFF LOCK POSITION SWITCH	DLN-267, "DTC Description"
P18D0	ABS SYSTEM	DLN-270, "DTC Description"
U1000	CAN COMM CIRCUIT	DLN-271, "DTC Description"
U1010	CONTROL UNIT (CAN)	DLN-272, "DTC Description"

NOTE:

If some DTCs are displayed at the same time, refer to DLN-220, "DTC Inspection Priority Chart".

[REAR FINAL DRIVE: MA248 (ELD)]



AADWA0432GB



B77				TH16FW-NH	WHITE			[1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16				Signal Name		SOLENOID ()		1		DIFF FOON ON SW	- NOI		CAN-H	SUL BAIT	GND	GNU	DIFF LOCK POSITION SW		UILT FOCK OFF 3W	CAN-I	ONINE																					
ector No.	ator Name	ector name		ector Type	ector Color			ſ	3				a series of the	Mira Wira)	- >	,	'	' ç	e/0		-		H (a (α.	-		5		c																					
Conne		Conne		Conne	Conne	f	del del	Ŧ					F			- °	1 0	° •	4	n u		- 0		D 9				2	± +	2 9	2																					
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HAHNESS	TO MAIN HARNESS	TO MAIN LADNESS	TO MAIN HARNESS	TO MANN I ADVICE	I U MAIN HAHNESS														
_	æ	w	۲/G	0	'	SHIELD	σ	1	RW	۲w	SHIELD	•	SHIELD	OL	SHIELD	BB	N	•		'	SHIELD	LG/B	œ	SHIELD	GR/B	8	M	SHIELD	L/R	-	1	Y/B	σ	B/R	SHIELD	GR/R	-	L/B	SB	8	- !	, LG	r è	1/0	MA CO		SB					
54J	55J	56J	57J	58J	59J	601	61J	62J	63.1	64J	65J	66J	67J	68J	691	201	L17	72.J	72J	73.J	74J	75J	76J	F22	78J	L97	80.1	81J	82J	83J	84.J	85J	86J	87J	88.1	89J	P06	91J	92J	93J	94.1	951	961	100	000	1001	0001					
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	IO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		I O MAIN HAHNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HADNESS	TO MAIN HABNESS										
٩.	RY	۲	L/B	GW	LGN	BR/LG	SB/BR	BR	BR	O/B	_	SB/O	7		æ	σ	SB	0	0/B	Y/R	٩	M	W/R	>		æ		G/O	SB	ГG	æ	-	٨	٩	G/R	LG/B	SB	٨L	BR	_		3	H 2		V/GB		>	BHV	M/5	CHIELD		c
2	51	3J	4J	51	61	L7	6	P6	101	L11	12J	13J	14.1	15.1	16.1	L71	18.1	19.1	20J	21J	22J	23J	24J	25J	26J	27J	28J	29.1	30.1	31J	32J	33J	34J	35J	36J	37J	38.)	391	40	41J	42J	431	441	194	47.1		481	490	112	165	52.1	200
B41			NS12MW-CS	WHITE				1 2 3 4 5	6 7 8 9 10 11 12				of Signal Name		I O ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS		TO ENGINE ROOM HARNESS	TO ENGINE HOUM HARNESS	U I U ENGINE HOOM HAHNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS		B69	WIRE TO WIRE	TH80MW-CS16-TM4	WHITE				51 41 31 21 11	10, 8, 6, 7, 6,	21.1 20.1 19.1 18.1 17.1 16.1 15.1 14.1 13.1 12.1 11.1	30/ 28/ 28/ 27/ 26/ 25/ 24/ 23/ 22/	144 401 26 36 36 36 36 36 00 104 44	500 49J 48J 47J 46J 45J 44J 43J 43J 42J		701 690 580 571 560 551 641 531 521 711		81.1 800 / 301 / 501 / 501 / 501 / 501 / 501 / 221 / 731 901 801 881 871 861 851 861 851 841 853 821 823		95J 94J 93J 92J 91J	100/ 99/ 98/ 97/ 96/				or Signal Name	-			
Connector No.	Connector Name	Connector Name	Connector Type	Connector Color	Ĩ	서버서							Terminal Color	NO. WIFE		2 0	• ·	4 L/G	5 R/G	6 SB	н . - с		6 SHIELL	10 M/G	-	12 BR		Connector No.	Connector Name	Connector Type	Connector Color			Ŭ	Ч.О.П Г															C I	Nino Mino	NU. VIIG

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

2016 Titan NAM

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

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3 Y TO ENGINE ROOM HARNESS	4 W TO ENGINE ROOM HARNESS	6 L TO ENGINE ROOM HARNESS	7 R TO ENGINE ROOM HARNESS	8 – TO ENGINE ROOM HARNESS	9 - TO ENGINE ROOM HARNESS	10 - TO ENGINE ROOM HARNESS	11 – TO ENGINE ROOM HARNESS	12 R TO ENGINE ROOM HARNESS		Connector No. C23	Connector Name WIRE TO WIRE	Connector Type RH12FB	Connector Color BLACK				6 5 4 3 2 1	12 11 10 9 8 7			Terminal Color of	No. Wire Signal Name	1 L TO SIDE RADAR SUB HARNESS	2 B TO SIDE RADAR SUB HARNESS	3 – TO SIDE RADAR SUB HARNESS	4 – TO SIDE RADAR SUB HARNESS	5 LG TO SIDE RADAR SUB HARNESS	6 L TO SIDE RADAR SUB HARNESS	7 R TO SIDE RADAR SUB HARNESS	a 7 10 SIDE HAUAH SUB HANNESS	10 - TO SIDE RADAR SUB HARNESS	11 W TO SIDE RADAR SUB HARNESS	12 R TO SIDE RADAR SUB HARNESS												
Connector No. C16	Connector Name DIFFERENTIAL LOCK	POSITION SWITCH	Connector Type RS02FGY	Connector Color GRAY			H.S.		1 2			Terminal Color of Sized Name	No. Wire ognar warne	1 L DIFF LOCK POSITION SW	2 B GROUND		Connector No. C17	Connector Name DIFFERENTIAL LOCK	SOLENOID	Connector Type RK02FB	Connector Color BLACK			H.S.		1 2)		Terminal Color of Signal Name	No. Wire Oignan wante	1 Y SOLENOID (+)		Connector No C20	Connector Name WIRE TO WIRE	Connector Type RH12MB				1 2 3 4 5 6	7 8 9 10 11 12			Terminal Color of Signal Name	No. Wire Jugital Marile	2 B TO ENGINE ROOM HARNESS
TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	WITH CUMMINS 5.0L)	TO ENGINE ROOM HARNESS -	(WITH VK56VD)	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)	TO ENGINE ROOM HARNESS -	(WITH VK56VD)	I U ENGINE HOUM HARNESS - (WITH CUMMINS 5.0L)	TO ENGINE ROOM HARNESS -	TO ENGINE ROOM HARNESS												
SHIELD	G/B G/B	×	•	ГG	GW	R/LG	RL	•	œ	L	-	NH .	- >	- 8	; a	٩	>	LG/B	Y/B	œ	σ	BR	m	A/R	Ь/Н	>		۵	ВV	:	>	•	M/N												
22C	23C 24C	25C	26C	27C	28C	29C	30C	31C	32C	33C	34C	350	360	380	390	40C	41C	42C	43C	44C	45C	46C	47C	48C	490	49C		50C	50C	01	210	51C	52C												
No. C1	Name WIRE TO WIRE	Type RK26FGY-RS20-X6	Color GRAY		4C 3C 2C 1C			21C 20C 19C 18C 17C 16C 15C 14C 13C 12C		31C 30C 29C 28C 27C 26C 25C 24C 23C 22C		410 400 390 380 370 360 350 350 330 320	47C 46C 45C 44C 43C 42C	52C 51C 50C 49C 48C			Volor of Signal Name	Y/V TO ENGINE ROOM HARNESS	W/L TO ENGINE ROOM HARNESS	B TO ENGINE ROOM HARNESS	BR/W TO ENGINE ROOM HARNESS	BR/Y TO ENGINE ROOM HARNESS	Y TO ENGINE ROOM HARNESS	G/R TO ENGINE ROOM HARNESS -		H I U ENGINE KUOM HARNESS - (WITH VK66VD)	B TO ENGINE ROOM HARNESS -	(WITH CUMMINS 5.0L)	U/B I U ENGINE HOUM HANNESS - (WITH VK56VD)	W/L TO ENGINE ROOM HARNESS -	SE TO ENGINE POOM HARNESS -	(WITH VK56VD)	GR/R TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)	GR TO ENGINE ROOM HARNESS - (WITH VK56VD)	B TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)	R/W TO ENGINE ROOM HARNESS -	Y TO ENGINE ROOM HARNESS	B TO ENGINE ROOM HARNESS	BG TO ENGINE ROOM HARNESS	Y TO ENGINE ROOM HARNESS	B TO ENGINE ROOM HARNESS	V TO ENGINE ROOM HARNESS	BG TO ENGINE ROOM HARNESS	L TO ENGINE ROOM HARNESS W TO ENGINE ROOM HARNESS	LG TO ENGINE ROOM HARNESS
Connector 1	Connector I	Connector 7	Connector (ľ		H.S.										Terretuel	No.	10	2C	g	4C	50	90	7C	ç	2	о ВС	ę	2	30	ÿ	3	10C	10C	11C	11C	12C	13C	14C	15C	16C	17C	18C	20C	21C

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

< WIRING DIAGRAM >

Connector		0100	12	ВВ	TO BODY HARNESS	20C	BG	TO CHASSIS HARNESS	Connector No	Ŭ	
		0.0				21C	•	TO CHASSIS HARNESS		3	-
Connector	Name	WIRE TO WIRE	Connector			22C	SHIELD	TO CHASSIS HARNESS	Connector Nam	ne W	RE TO WIRE
Connector	Type	RH12MB	CONTRACTOR	.00		23C	G/B	TO CHASSIS HARNESS	Connector Type	e B	112FB
Connector	Color	BLACK	Connector	Name	WIRE TO WIRE	24C	GУ	TO CHASSIS HARNESS	Connector Cold	or BL	ACK
ł			Connector	Type	3K26MGY-RS20-X6	25C	8	TO CHASSIS HARNESS	Ŧ		
dHdh			Connector	Color	GRAY	26C	в	TO CHASSIS HARNESS	1444h		
ЯH			fe			27C	LG	TO CHASSIS HARNESS	SH		K
5		1 2 3 4 5 6		ţ	20 30 40	28C	G/W	TO CHASSIS HARNESS	5		6 5 4 3 2 1
		7 8 9 10 11 12	H.S.	2 20	C 8C 24 34 44 35 10C 11C	29C	G/R	TO CHASSIS HARNESS - (WITH BULB CHECK)			12 11 10 9 8 7
				12C 13	c 14C 15C 16C 17C 18C 19C 20C 21C	29C	R/G	TO CHASSIS HARNESS - (WITHOUT BULB CHECK)			
Tominol	20100					30C	RL	TO CHASSIS HARNESS	Tominol	1000	
No.	Wire	or Signal Name		22C 23	2 24C 25C 26C 27C 28C 29C 30C 31C	31C	B	TO CHASSIS HARNESS	No. V	Vire	Signal Name
-		TO CHASSIS HARNESS		32C 33	C 34C 35C 36C 37C 38C 39C 40C 41C	32C	æ	TO CHASSIS HARNESS	-	_	TO CHASSIS HARN
2	•	TO CHASSIS HARNESS				33C	۲	TO CHASSIS HARNESS	2		TO CHASSIS HARN
3	'	TO CHASSIS HARNESS		42C 4	3C 44C 45C 46C 47C	34C		TO CHASSIS HARNESS	3	в	TO CHASSIS HARN
4	1	TO CHASSIS HARNESS		48C	49C 50C 51C 52C	35C	NR.	TO CHASSIS HARNESS	4	M	TO CHASSIS HARN
5	ГG	TO CHASSIS HARNESS				360	-	I U CHASSIS HAHNESS	5	g	TO CHASSIS HARN
9	-	TO CHASSIS HARNESS	Tominol	Color of		37C	> {	TO CHASSIS HARNESS	9	-	TO CHASSIS HARN
2	ш	TO CHASSIS HARNESS		Wire U	Signal Name	380	H (TO CHASSIS HAHNESS	7	œ	TO CHASSIS HARN
8	æ	TO CHASSIS HARNESS				39C	œ	TO CHASSIS HARNESS	8	1	TO CHASSIS HARN
6	ı	TO CHASSIS HARNESS	<u>ي</u> ہ	1/1	TO CHASSIS HAHNESS	40C	• :	TO CHASSIS HARNESS	6	,	TO CHASSIS HARN
10	'	TO CHASSIS HARNESS	2	N/F		41C	>	TO CHASSIS HARNESS	10	1	TO CHASSIS HARN
Ħ	N	TO CHASSIS HARNESS	ູ່	B	TO CHASSIS HARNESS	42C	G/B	TO CHASSIS HARNESS	11	1	TO CHASSIS HARN
12	н	TO CHASSIS HARNESS	5	M/HO		43C	Y/B	TO CHASSIS HARNESS	12	в	TO CHASSIS HARN
			່ວ	۲ ۲	TO CHASSIS HAHNESS TO CHASSIS HARNESS	44C	œ (TO CHASSIS HARNESS			
Connector	No.	E35		-		100					
Connector	Name	WIRE TO WIRE	2	c	VK56VD)	460	Ϋ́α	TO CHASSIS HARNESS TO CHASSIS HARNESS			
Connector	Type	NS12FW-CS	7C	G/R	TO CHASSIS HARNESS - (WITH CLIMMINS 5 01)	48C	Y,R	TO CHASSIS HARNESS			
Connector	Color	WHITE	80	O/B	TO CHASSIS HARNESS - (WITH	49C	>	TO CHASSIS HARNESS - (WITH VK56VD)			
E			80	æ	TO CHASSIS HARNESS - (WITH	49C	RY	TO CHASSIS HARNESS - (WITH			
					CUMMINS 5.0L)	001		COMMINS 5.UL)			
Н.S.		5 4 3 2 1	90	8	TO CHASSIS HARNESS - (WITH VK56VD)	200	BV	TO CHASSIS HARNESS - (WITH VK56VD)			
		12 11 10 9 8 7 6	90	WIL	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)	50C	8	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)			
			100	GR	TO CHASSIS HARNESS - (WITH VK56VD)	51C	8	TO CHASSIS HARNESS - (WITH VK56VD)			
Terminal	Color	of Signal Name	100	GR/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)	51C	^	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)			
No.	Wire	0	11C	R/W	TO CHASSIS HARNESS - (WITH	52C	W/N	TO CHASSIS HARNESS			
-	>	TO BODY HARNESS			VK56VD)	52C	•	TO CHASSIS HARNESS -			
2	>	TO BODY HARNESS	11C	8	TO CHASSIS HARNESS - (WITH CLIMMINS 5 OL)	001		(WITHOUT FFV)			
e	-	TO BODY HARNESS	190	>	TO CHASSIS HADNESS	2270		I O CHASSIS HARNESS - (WITH FFV)			
4	≥	TO BODY HARNESS	1021	-							
2	R/G	TO BODY HARNESS									
9	ß	TO BODY HARNESS	14C	5 BG	TO CHASSIS HARNESS						
7	٩	TO BODY HARNESS	190		IO CHASSIS HARNESS						
8	-	TO BODY HARNESS	160		TO CHASSIS HARNESS						
6	SHIELL	D TO BODY HARNESS	170	>	TO CHASSIS HARNESS						
10	8	TO BODY HARNESS	180	5 <u>9</u> .	TO CHASSIS HAHNESS						
ŧ	щ	TO BODY HARNESS	19C		TO CHASSIS HARNESS						



< WIRING DIAGRAM >

Signal Name	TO CHASSIS HARNESS											
Color of Wire	-	8	æ	×	σ	_	æ	1	1	-	1	н
Terminal No.	-	2	e	4	S	9	7	8	6	10	11	12

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Revision: March 2016

AADIA1217GB

Connectu	or No.	E152	24G	G/B	TO MAIN HARNESS	77G	ອ	TO MAIN HARNESS	15P	Y/LG	BATTERY
Connecte	or Name	WIRE TO WIRE	2562	MY a	TO MAIN HARNESS TO MAIN HARNESS	796	× '	TO MAIN HARNESS TO MAIN HARNESS	191	•	BLOWEH FAN HELAY OU
Connect	or Type	TH80MW-CS16-TM4	27G	: 9	TO MAIN HARNESS	806	æ	TO MAIN HARNESS			
Connect	or Color	WHITE	28G	G/B	TO MAIN HARNESS	81G	-	TO MAIN HARNESS	Connector No.	Ξ	
f			29G	G/B	TO MAIN HARNESS	82G	æ	TO MAIN HARNESS	Connector Nan		MBINATION METER TH TYPE A)
			30G	BR/Y	TO MAIN HARNESS	83G	-	TO MAIN HARNESS	Connector Tvp	e TH1	2FW-NH
H.S.	L		31G	• •	TO MAIN HARNESS TO MAIN HAPNESS	84G	W/B	TO MAIN HARNESS TO MAIN HADNESS	Connector Col	lor WH	TE
		5G 4G 3G 2G 1G	336	. 17	TO MAIN HARNESS	866	B/B	TO MAIN HARNESS	Æ		
		10G 9G 8G 7G 6G	34G	В	TO MAIN HARNESS	87G	W/B	TO MAIN HARNESS	(44,44)		
		216/206/196/186/176/166/156/146/136/126/116	35G	G/R	TO MAIN HARNESS	88G	٩	TO MAIN HARNESS	H.S.H	L	
		306296286276286256246236226	36G	BB	TO MAIN HARNESS	89G	_	TO MAIN HARNESS			41 42 43 44 45 46
		410400390380370360350340330320310	37G	RW	TO MAIN HARNESS	90G	IJ	TO MAIN HARNESS			47 48 49 50 51 52
		5064966476466456446436436426	38G	В	TO MAIN HARNESS	91G	J	TO MAIN HARNESS		L	
		61G 60G 59G 58G 57G 56G 55G 54G 53G 52G 51G	39G	ВВ	TO MAIN HARNESS	92G	٨٧	TO MAIN HARNESS			
		7066906806766666566466836626	40G	'	TO MAIN HARNESS	93G	H	TO MAIN HARNESS	Terminal Co	olor of	Citeral News
		81680579578577676765756746735725715	41G	R/G	TO MAIN HARNESS	94G	g	TO MAIN HARNESS	No.	Wire	signal Name
		90C 89C 88C 87C 86C 85C 84C 83C 82C	42G	0	TO MAIN HARNESS	95G	IJ	TO MAIN HARNESS	41	-	CAN-H
		ase and and and 91G	43G	B	TO MAIN HARNESS	96G	>	TO MAIN HARNESS	42	۵.	CAN-L
		1006 996 986 976 966	44G	RY	TO MAIN HARNESS	97G	æ	TO MAIN HARNESS	43	٨٨	ILL CONT OUT
			45G	σ	TO MAIN HARNESS	98G	W/B	TO MAIN HARNESS	44	GR	FUEL SENSOR GND
			46G	ГG	TO MAIN HARNESS	9 9 G	щ	TO MAIN HARNESS	45	œ	BAT
			47G	œ	TO MAIN HARNESS	100G	GR/W	TO MAIN HARNESS	46	M	IGN
			48G	N	TO MAIN HARNESS				47	m	M-CAN-H
Termina	I Color o	of Simul Name	49G	ı	TO MAIN HARNESS	Connector	No. M		48	BR/Y	M-CAN-L
No.	Wire	signal Name	50G	н	TO MAIN HARNESS	Connector	Name FU	SE BLOCK (J/B)	49		ı
1G	9	TO MAIN HARNESS	51G	œ	TO MAIN HARNESS	Connector	Time	HEFW-CS	50		
2G	B/R	TO MAIN HARNESS	52G		TO MAIN HARNESS	Connector		101 M-00	51	FG	FUEL SENSOR
36	W/B	TO MAIN HARNESS	53G	× ;	TO MAIN HARNESS	Collector	COIOI W.		52	8	G1
4G	BR/W	TO MAIN HARNESS	54G	>	TO MAIN HARNESS	E					
5G	BB	TO MAIN HARNESS	55G	σ :	TO MAIN HARNESS				Γ		
99	RM	TO MAIN HARNESS	56G	N :	TO MAIN HARNESS	H.S.	7P 6P 5	5P 4P 3P 2P 1P			
7G	>	TO MAIN HARNESS	57G	>	TO MAIN HARNESS		16P 15P 1	4P13P12P11P11P10P 9P 8F			
86	σ	TO MAIN HARNESS	58G	59	I O MAIN HARNESS			5 5 1 1			
96	æ	TO MAIN HARNESS	59G	BG	TO MAIN HARNESS						
10G	×	TO MAIN HARNESS	606		TO MAIN HARNESS						
11G	R/G	TO MAIN HARNESS	000	• 3	TO MAIN HADNESS	Terminal	Color of	Signal Name			
120	8/M	TO MAIN HARNESS	63G	: @	TO MAIN HARNESS	No.	Wire				
971		TO MAIN HAPNESS	64G	WL	TO MAIN HARNESS	4 I	œ :	IGNITION			
15G	g Wg	TO MAIN HARNESS	65G	W/R	TO MAIN HARNESS	47, 66	> (
16G	σ	TO MAIN HARNESS	66G	BG	TO MAIN HARNESS		5				
17G	GN	TO MAIN HARNESS	67G	BG	TO MAIN HARNESS	F G	a Ma	RR DEF RLY			
18G	G√	TO MAIN HARNESS	68G	в	TO MAIN HARNESS	dy	c	RR DEF RIV OLIT			
19G	٨٨	TO MAIN HARNESS	969	~	TO MAIN HARNESS	7P	J	IGNITION			
20G	G√	TO MAIN HARNESS	70G	L	TO MAIN HARNESS	89	>	IGNITION			
21G	BΛ	TO MAIN HARNESS	71G	RW	TO MAIN HARNESS	д 6	-	BATTERY			
22 0	G/R	TO MAIN HARNESS - (WITH	72G		TO MAIN HARNESS	10P	1	•			
530	G√	TO MAIN HARNESS - (WITH	74G	M M	TO MAIN HARNESS	11P	'	-			
218		VK56VD)	75G	. œ	TO MAIN HARNESS	12P	'	1			
53G	Y/R	TO MAIN HARNESS	76G	R/G	TO MAIN HARNESS	13P	œ ;	BATTERY			
				-		14P	~	BATTERY			



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Multiple Construction	Connector Colo	r WHITE	296	G/B	TO ENGINE ROOM HARNESS	82G	œ	TO ENGINE ROOM HARNESS
	1		306	BRV	TO ENGINE ROOM HARNESS	836	-	TO ENGINE ROOM HARNESS
	ug qu				TO ENGINE DOOM HADNESS	949		TO ENGINE DOOM HABNESS
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(1) (2) (7) <td>No.</td> <td>lire oignar Name</td> <td>51G</td> <td>æ</td> <td>TO ENGINE ROOM HARNESS</td> <td></td> <td></td> <td></td>	No.	lire oignar Name	51G	æ	TO ENGINE ROOM HARNESS			
26 6 7 70 ENGINE FOOM HARNESS 36 W 10 ENGINE FOOM HARNESS 560 W 10 ENGINE FOOM HARNESS 46 B/W 10 ENGINE FOOM HARNESS 560 W 10 ENGINE FOOM HARNESS 56 R/W 10 ENGINE FOOM HARNESS 570 V 10 ENGINE FOOM HARNESS 56 R/W 10 ENGINE FOOM HARNESS 573 V 10 ENGINE FOOM HARNESS 96 R 10 ENGINE FOOM HARNESS 560 B 10 ENGINE FOOM HARNESS 910 W 10 ENGINE FOOM HARNESS 560 B 10 ENGINE FOOM HARNESS 910 W 10 ENGINE FOOM HARNESS 560 B 10 ENGINE FOOM HARNESS 110 W 10 ENGINE FOOM HARNESS 560 M 10 ENGINE FOOM HARNESS 110 W 10 ENGINE FOOM HARNESS 560 M 10 ENGINE FOOM HARNESS	16	G TO ENGINE ROOM HARNESS	52G	-	TO ENGINE ROOM HARNESS			
36 W TO ENGINE FOOM HARNESS 54G W TO ENGINE FOOM HARNESS 66 FMW TO ENGINE FOOM HARNESS 56G W TO ENGINE FOOM HARNESS 76 FW TO ENGINE FOOM HARNESS 57G Y TO ENGINE FOOM HARNESS 76 Y TO ENGINE FOOM HARNESS 57G Y TO ENGINE FOOM HARNESS 76 Y TO ENGINE FOOM HARNESS 57G Y TO ENGINE FOOM HARNESS 76 Y TO ENGINE FOOM HARNESS 57G Y TO ENGINE FOOM HARNESS 96 P TO ENGINE FOOM HARNESS 56G BG TO ENGINE FOOM HARNESS 106 W TO ENGINE FOOM HARNESS 56G BG TO ENGINE FOOM HARNESS 116 W TO ENGINE FOOM HARNESS 56G BG TO ENGINE FOOM HARNESS 116 W TO ENGINE FOOM HARNESS 56G W TO ENGINE FOOM HARNESS 116 FG W TO ENGINE FOOM HARNESS 56G W TO ENGINE FOOM HARNESS 116 FG	2G B	IN TO ENGINE ROOM HARNESS	53G	>	TO ENGINE ROOM HARNESS			
4(2) BR/M TO ENGINE FOOM HARKESS 560 C TO ENGINE FOOM HARKESS 6(3) Y TO ENGINE FOOM HARKESS 560 Y TO ENGINE FOOM HARKESS 6(4) Y TO ENGINE FOOM HARKESS 560 Y TO ENGINE FOOM HARKESS 7(3) Y TO ENGINE FOOM HARKESS 560 PG TO ENGINE FOOM HARKESS 8(6) F TO ENGINE FOOM HARKESS 560 PG TO ENGINE FOOM HARKESS 9(4) F TO ENGINE FOOM HARKESS 560 PG TO ENGINE FOOM HARKESS 11(6) P/4 TO ENGINE FOOM HARKESS 560 PG TO ENGINE FOOM HARKESS 12(6) W TO ENGINE FOOM HARKESS 560 PG TO ENGINE FOOM HARKESS 12(6) W TO ENGINE FOOM HARKESS 560 PG TO ENGINE FOOM HARKESS 12(6) W TO ENGINE FOOM HARKESS 560 W TO ENGINE FOOM HARKESS 12(6) W TO ENGINE FOOM HARKESS 560 W TO ENGINE FOOM HARKESS 12(6) W <td>36</td> <td>W TO ENGINE ROOM HARNESS</td> <td>54G</td> <td>×</td> <td>TO ENGINE ROOM HARNESS</td> <td></td> <td></td> <td></td>	36	W TO ENGINE ROOM HARNESS	54G	×	TO ENGINE ROOM HARNESS			
61 10 10 ENGINE FOOM HARNESS 950 W 10 ENGINE FOOM HARNESS 73 Y TO ENGINE FOOM HARNESS 950 Y TO ENGINE FOOM HARNESS 73 Y TO ENGINE FOOM HARNESS 960 BG TO ENGINE FOOM HARNESS 86 A TO ENGINE FOOM HARNESS 960 BG TO ENGINE FOOM HARNESS 90 F TO ENGINE FOOM HARNESS 960 BG TO ENGINE FOOM HARNESS 106 F TO ENGINE FOOM HARNESS 960 BG TO ENGINE FOOM HARNESS 110 F TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 110 F TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 110 W TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 110 M TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 110 M TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 110 M TO ENGINE	4G BF	TO ENGINE ROOM HARNESS	55G	σ	TO ENGINE ROOM HARNESS			
60 PW TO ENGINE FOOM HARNESS 57G Y TO ENGINE FOOM HARNESS 76 Y TO ENGINE FOOM HARNESS 96 BG TO ENGINE FOOM HARNESS 96 R TO ENGINE FOOM HARNESS 96 BG TO ENGINE FOOM HARNESS 96 R TO ENGINE FOOM HARNESS 96 DE ONE IERCOM HARNESS 106 W TO ENGINE FOOM HARNESS 96 DE ONE HARNESS 116 KG TO ENGINE FOOM HARNESS 96 DE ONE HARNESS 126 W TO ENGINE FOOM HARNESS 96 DE ONM HARNESS 136 R TO ENGINE FOOM HARNESS 96 DE ONM HARNESS 136 R TO ENGINE FOOM HARNESS 96 DE ONM HARNESS 136 R TO ENGINE FOOM HARNESS 96 M TO ENGINE FOOM HARNESS 136 R TO ENGINE FOOM HARNESS 96 M TO ENGINE FOOM HARNESS 136 C TO ENGINE FOOM HARNESS 96 M TO ENGINE FOOM HARNESS 136 C T	5G	3R TO ENGINE ROOM HARNESS	56G	×	TO ENGINE ROOM HARNESS			
Tot Tot Detointe FDOM HARNESS 560 BG Tot Detointe FDOM HARNESS 86 a TOT DEHOINTE FDOM HARNESS 650 BG TO ENGINE FDOM HARNESS 106 W TOT DEHOINTE FDOM HARNESS 650 BG TO ENGINE FDOM HARNESS 116 M TO ENGINE FDOM HARNESS 610 D TO ENGINE FDOM HARNESS 126 W TO ENGINE FDOM HARNESS 610 D TO ENGINE FDOM HARNESS 126 W TO ENGINE FDOM HARNESS 620 W TO ENGINE FDOM HARNESS 126 W TO ENGINE FDOM HARNESS 620 W TO ENGINE FDOM HARNESS 126 W TO ENGINE FDOM HARNESS 620 W TO ENGINE FDOM HARNESS 126 W TO ENGINE FDOM HARNESS 620 W TO ENGINE FDOM HARNESS 126 W TO ENGINE FDOM HARNESS 620 W TO ENGINE FDOM HARNESS 126 G TO ENGINE FDOM HARNESS 650 W TO ENGINE FDOM HARNESS 126 G TO ENGINE FDOM HARN	6G	W TO ENGINE ROOM HARNESS	57G	>	TO ENGINE ROOM HARNESS			
8c c TO ENGINE FOOM HARNESS 960 BG TO ENGINE FOOM HARNESS 10 W TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 116 Prd TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 116 Prd TO ENGINE FOOM HARNESS 600 BG TO ENGINE FOOM HARNESS 126 WB TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 BR TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 V/B TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 V/B TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 W TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 G/W TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 G/W TO ENGINE FOOM HARNESS 600 W TO ENGINE FOOM HARNESS 136 G/W	7G	Y TO ENGINE ROOM HARNESS	58G	BG	TO ENGINE ROOM HARNESS			
96 R 1 0 ENGINE FOOM HARNESS 903 B 10 ENGINE FOOM HARNESS 110 W 10 ENGINE FOOM HARNESS 610 0 10 ENGINE FOOM HARNESS 113 Br 10 ENGINE FOOM HARNESS 610 0 10 ENGINE FOOM HARNESS 126 WB 10 ENGINE FOOM HARNESS 630 0 10 ENGINE FOOM HARNESS 136 Br 10 ENGINE FOOM HARNESS 630 0 10 ENGINE FOOM HARNESS 136 Br 10 ENGINE FOOM HARNESS 630 0 10 ENGINE FOOM HARNESS 136 G/W 10 ENGINE FOOM HARNESS 630 0 10 ENGINE FOOM HARNESS 136 G/W 10 ENGINE FOOM HARNESS 630 W 10 ENGINE FOOM HARNESS 146 G/W 10 ENGINE FOOM HARNESS 640 WT 10 ENGINE FOOM HARNESS 146 G/W 10 ENGINE FOOM HARNESS 640 WT 10 ENGINE FOOM HARNESS 176 G/W 10 ENGINE FOOM HARNESS 640 WT 10 ENGINE FOOM HARNESS 176 <td< td=""><td>86</td><td>G TO ENGINE ROOM HARNESS</td><td>59G</td><td>BG</td><td>TO ENGINE ROOM HARNESS</td><td></td><td></td><td></td></td<>	86	G TO ENGINE ROOM HARNESS	59G	BG	TO ENGINE ROOM HARNESS			
I0 W TO ENGINE FOOM HARNESS 61G O TO ENGINE FOOM HARNESS 110 R/A TO ENGINE FOOM HARNESS 62G W TO ENGINE FOOM HARNESS 126 W/B TO ENGINE FOOM HARNESS 63G O TO ENGINE FOOM HARNESS 136 B/R TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 Y/B TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 Y/B TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 C TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 C TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 C TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 C TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 C TO ENGINE FOOM HARNESS 64G W/L TO ENGINE FOOM HARNESS 146 C	96	R TO ENGINE ROOM HARNESS	800	BG	TO ENGINE ROOM HARNESS			
III RIG TO ENGINE FOOM HARNESS CC W TO ENGINE FOOM HARNESS 126 W/B TO ENGINE FOOM HARNESS 63 0 TO ENGINE FOOM HARNESS 136 B TO ENGINE FOOM HARNESS 64 W/L TO ENGINE FOOM HARNESS 146 Y/B TO ENGINE FOOM HARNESS 66 W/R TO ENGINE FOOM HARNESS 156 Q/W TO ENGINE FOOM HARNESS 66 B/R TO ENGINE FOOM HARNESS 156 Q/W TO ENGINE FOOM HARNESS 66 B/R TO ENGINE FOOM HARNESS 156 Q/W TO ENGINE FOOM HARNESS 66 B/R TO ENGINE FOOM HARNESS 156 Q/W TO ENGINE FOOM HARNESS 66 B/R TO ENGINE FOOM HARNESS 156 Q/W TO ENGINE FOOM HARNESS 66 B/R TO ENGINE FOOM HARNESS 156 Q/W TO ENGINE FOOM HARNESS 66 B/R TO ENGINE FOOM HARNESS 206 Q/W TO ENGINE FOOM HARNESS 706 L TO ENGINE FOOM HARNESS 210 M/R <td>10G</td> <td>W TO ENGINE ROOM HARNESS</td> <td>619</td> <td>0</td> <td>TO ENGINE ROOM HARNESS</td> <td></td> <td></td> <td></td>	10G	W TO ENGINE ROOM HARNESS	619	0	TO ENGINE ROOM HARNESS			
126 W/B 10 ENGINE FOOM HARNESS 636 0 10 ENGINE FOOM HARNESS 136 B 10 ENGINE FOOM HARNESS 640 W/L 10 ENGINE FOOM HARNESS 146 Y/B 10 ENGINE FOOM HARNESS 640 W/L 10 ENGINE FOOM HARNESS 146 Y/B 10 ENGINE FOOM HARNESS 640 W/L 10 ENGINE FOOM HARNESS 146 A 10 ENGINE FOOM HARNESS 640 W/L 10 ENGINE FOOM HARNESS 146 A 10 ENGINE FOOM HARNESS 640 P 10 ENGINE FOOM HARNESS 146 A 10 ENGINE FOOM HARNESS 640 P 10 ENGINE FOOM HARNESS 146 G/Y 10 ENGINE FOOM HARNESS 640 P 10 ENGINE FOOM HARNESS 146 G/Y 10 ENGINE FOOM HARNESS 640 P 10 ENGINE FOOM HARNESS 206 G/Y 10 ENGINE FOOM HARNESS 700 L 10 ENGINE FOOM HARNESS 206 Y 10 ENGINE FOOM HARNESS 700 L 10 ENGINE FOOM HARNESS 207 G/Y	11G	VG TO ENGINE ROOM HARNESS	62G	>	TO ENGINE ROOM HARNESS			
13 BR TO ENGINE FOOM HARNESS 64G W.L TO ENGINE FOOM HARNESS 14 Y/B TO ENGINE FOOM HARNESS 66G W/R TO ENGINE FOOM HARNESS 16 G/N TO ENGINE FOOM HARNESS 66G W/R TO ENGINE FOOM HARNESS 16 G/N TO ENGINE FOOM HARNESS 66G W/R TO ENGINE FOOM HARNESS 170 O TO ENGINE FOOM HARNESS 67G O TO ENGINE FOOM HARNESS 186 G/N TO ENGINE FOOM HARNESS 67G O TO ENGINE FOOM HARNESS 196 V/N TO ENGINE FOOM HARNESS 67G O TO ENGINE FOOM HARNESS 206 G/N TO ENGINE FOOM HARNESS 66G Y TO ENGINE FOOM HARNESS 206 G/N TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/N TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/N TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/N	12G M	<pre>//B TO ENGINE ROOM HARNESS</pre>	63G	0	TO ENGINE ROOM HARNESS			
14 YIB TO ENGINE FOOM HARNESS 663 W/R TO ENGINE FOOM HARNESS 150 0.W TO ENGINE FOOM HARNESS 660 BG TO ENGINE FOOM HARNESS 166 0 TO ENGINE FOOM HARNESS 660 BG TO ENGINE FOOM HARNESS 176 0 TO ENGINE FOOM HARNESS 660 B TO ENGINE FOOM HARNESS 176 0 TO ENGINE FOOM HARNESS 660 B TO ENGINE FOOM HARNESS 196 X/V TO ENGINE FOOM HARNESS 660 B TO ENGINE FOOM HARNESS 206 X/V TO ENGINE FOOM HARNESS 706 L TO ENGINE FOOM HARNESS 206 X/V TO ENGINE FOOM HARNESS 706 L TO ENGINE FOOM HARNESS 206 X/V TO ENGINE FOOM HARNESS 706 L TO ENGINE FOOM HARNESS 206 X/V TO ENGINE FOOM HARNESS 706 L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 706 L TO ENGINE FOOM HARNESS 206 G/Y	13G E	3R TO ENGINE ROOM HARNESS	64G	٨٧	TO ENGINE ROOM HARNESS			
160 0.0// TO ENGINE FOOM HARNESS 66G BG TO ENGINE FOOM HARNESS 160 d TO ENGINE FOOM HARNESS 67G 0 TO ENGINE FOOM HARNESS 170 0 TO ENGINE FOOM HARNESS 67G 0 TO ENGINE FOOM HARNESS 166 G/Y TO ENGINE FOOM HARNESS 67G 0 TO ENGINE FOOM HARNESS 166 G/Y TO ENGINE FOOM HARNESS 69G Y TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 207 G/Y	14G Y	VB TO ENGINE ROOM HARNESS	65G	W/R	TO ENGINE ROOM HARNESS			
16 C TO ENGINE FOOM HARNESS 67G O TO ENGINE FOOM HARNESS 173 0 TO ENGINE FOOM HARNESS 68G F TO ENGINE FOOM HARNESS 166 GAY TO ENGINE FOOM HARNESS 68G Y TO ENGINE FOOM HARNESS 196 Y/Y TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 GAY TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 GAY TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 GAY TO ENGINE FOOM HARNESS 70G L TO ENGINE FOOM HARNESS 206 GAY TO ENGINE FOOM HARNESS 70G LW TO ENGINE FOOM HARNESS 206 GAY TO ENGINE FOOM HARNESS 70G LW TO ENGINE FOOM HARNESS 207 GAY TO ENGINE FOOM HARNESS 70G LW TO ENGINE FOOM HARNESS 208 GAY TO ENGINE FOOM HARNESS 70G LW TO ENGINE FOOM HARNESS 208 GAY	15G G	/W TO ENGINE ROOM HARNESS	999	BG	TO ENGINE ROOM HARNESS			
17a 0 TO ENGINE FOOM HARNESS 68G B TO ENGINE FOOM HARNESS 166 G/Y TO ENGINE FOOM HARNESS 69G Y TO ENGINE FOOM HARNESS 176 M/Y TO ENGINE FOOM HARNESS 703 L TO ENGINE FOOM HARNESS 206 G/Y TO ENGINE FOOM HARNESS 703 L TO ENGINE FOOM HARNESS 216 B/Y TO ENGINE FOOM HARNESS 703 L TO ENGINE FOOM HARNESS 216 B/Y TO ENGINE FOOM HARNESS 703 LW TO ENGINE FOOM HARNESS 226 G/Y TO ENGINE FOOM HARNESS 736 SHIELD TO ENGINE FOOM HARNESS 226 G/Y TO ENGINE FOOM HARNESS 736 W TO ENGINE FOOM HARNESS 226 G/Y TO ENGINE FOOM HARNESS 736 W TO ENGINE FOOM HARNESS 226 G/Y TO ENGINE FOOM HARNESS 736 W TO ENGINE FOOM HARNESS 223 Y/R TO ENGINE FOOM HARNESS 736 R TO ENGINE FOOM HARNESS 233 Y/R <td>16G</td> <td>G TO ENGINE ROOM HARNESS</td> <td>67G</td> <td>0</td> <td>TO ENGINE ROOM HARNESS</td> <td></td> <td></td> <td></td>	16G	G TO ENGINE ROOM HARNESS	67G	0	TO ENGINE ROOM HARNESS			
16 C/r TO ENGINE FROM HARNESS 690 Y TO ENGINE FROM HARNESS 190 Y/V TO ENGINE FROM HARNESS 706 L TO ENGINE FROM HARNESS 201 G/r TO ENGINE FROM HARNESS 706 L TO ENGINE FROM HARNESS 216 B/r TO ENGINE FROM HARNESS 716 L/W TO ENGINE FROM HARNESS 216 B/r TO ENGINE FROM HARNESS 736 L/W TO ENGINE FROM HARNESS 226 G/r TO ENGINE FROM HARNESS 736 SHIELD TO ENGINE FROM HARNESS 226 G/r TO ENGINE FROM HARNESS 746 W TO ENGINE FROM HARNESS 226 V/R TO ENGINE FROM HARNESS 746 W TO ENGINE FROM HARNESS 236 V/R TO ENGINE FROM HARNESS 736 R/G TO ENGINE FROM HARNESS 236 V/R TO ENGINE FROM HARNESS 746 W TO ENGINE FROM HARNESS 236 V/R TO ENGINE FROM HARNESS 756 R/G TO ENGINE FROM HARNESS	17G	0 TO ENGINE ROOM HARNESS	689	8	TO ENGINE ROOM HARNESS			
19a YV TO ENGINE FROM HARNESS 70G L TO ENGINE FROM HARNESS 20a G/Y TO ENGINE FROM HARNESS 71G R/W TO ENGINE FROM HARNESS 21d B/Y TO ENGINE FROM HARNESS 71G R/W TO ENGINE FROM HARNESS 22d G/R TO ENGINE FROM HARNESS 73G SHELD TO ENGINE FROM HARNESS 22d G/R TO ENGINE FROM HARNESS 73G SHELD TO ENGINE FROM HARNESS 22d G/R TO ENGINE FROM HARNESS 73G SHELD TO ENGINE FROM HARNESS 22d G/Y TO ENGINE FROM HARNESS 74G R TO ENGINE FROM HARNESS 22d G/Y TO ENGINE FROM HARNESS 75G R TO ENGINE FROM HARNESS 22d V/R TO ENGINE FROM HARNESS 75G R TO ENGINE FROM HARNESS 23d V/R TO ENGINE FROM HARNESS 75G B/G TO ENGINE FROM HARNESS	18G G	TO ENGINE ROOM HARNESS	969	۲	TO ENGINE ROOM HARNESS			
206 G/Y TO ENGINE ROOM HARNESS 71G R/W TO ENGINE ROOM HARNESS 21G B/Y TO ENGINE ROOM HARNESS 72G L/W TO ENGINE ROOM HARNESS 226 G/R TO ENGINE ROOM HARNESS 73G SHELD TO ENGINE ROOM HARNESS 226 G/R TO ENGINE ROOM HARNESS 73G SHELD TO ENGINE ROOM HARNESS 226 G/Y TO ENGINE ROOM HARNESS 73G SHELD TO ENGINE ROOM HARNESS 226 G/Y TO ENGINE ROOM HARNESS 73G R TO ENGINE ROOM HARNESS 226 G/Y TO ENGINE ROOM HARNESS 73G R TO ENGINE ROOM HARNESS 226 V/R TO ENGINE ROOM HARNESS 73G R TO ENGINE ROOM HARNESS 226 V/R TO ENGINE ROOM HARNESS 73G R TO ENGINE ROOM HARNESS	19G Y	VV TO ENGINE ROOM HARNESS	70G	-	TO ENGINE ROOM HARNESS			
210 B/Y TO ENGINE ROOM HARNESS 720 L/W TO ENGINE ROOM HARNESS 226 G/R TO ENGINE ROOM HARNESS 736 SHIELD TO ENGINE ROOM HARNESS 226 G/R TO ENGINE ROOM HARNESS 736 SHIELD TO ENGINE ROOM HARNESS 226 G/Y TO ENGINE ROOM HARNESS 746 W TO ENGINE ROOM HARNESS 226 G/Y TO ENGINE ROOM HARNESS 743 W TO ENGINE ROOM HARNESS 236 Y/R TO ENGINE ROOM HARNESS 756 R TO ENGINE ROOM HARNESS 236 Y/R TO ENGINE ROOM HARNESS 776 B/G TO ENGINE ROOM HARNESS	20G	TO ENGINE ROOM HARNESS	71G	R/W	TO ENGINE ROOM HARNESS			
226 G/R TO ENGINE ROOM HARNESS- (WITH CUMMINS 5.U.) 733 SHIELD TO ENGINE ROOM HARNESS 226 G/Y TO ENGINE ROOM HARNESS- (WITH VK36VD) 743 W TO ENGINE ROOM HARNESS 233 Y/R TO ENGINE ROOM HARNESS 753 R/G TO ENGINE ROOM HARNESS 234 Y/R TO ENGINE ROOM HARNESS 775 B/G TO ENGINE ROOM HARNESS	21G E	3/Y TO ENGINE ROOM HARNESS	72G	ГVM	TO ENGINE ROOM HARNESS			
A (WTH CUMMINS 6.U) 74G W TO ENGINE FOOM HARLESS 226 G/Y TO ENGINE ROOM HARLESS 75G R TO ENGINE FOOM HARLESS 236 Y/R TO ENGINE FOOM HARLESS 76G B/G TO ENGINE FOOM HARLESS 236 Y/R TO ENGINE FOOM HARLESS 76G B/G TO ENGINE FOOM HARLESS	22G G	VR TO ENGINE ROOM HARNESS -	73G	SHIELD	TO ENGINE ROOM HARNESS			
226 G/V TO ENGINE ROOM HARNESS - 75G R TO ENGINE ROOM HARNESS - 75G 236 Y/R TO ENGINE ROOM HARNESS - 75G PIG TO ENGINE ROOM HARNESS - 77G 236 Y/R TO ENGINE ROOM HARNESS - 77G BG TO ENGINE ROOM HARNESS - 77G		(WITH CUMMINS 5.0L)	74G	>	TO ENGINE ROOM HARNESS			
23G Y/R TO ENGINE ROOM HARNESS 76G R/G TO ENGINE ROOM HARNESS 2.3	22G G	TO ENGINE ROOM HARNESS -	75G	æ	TO ENGINE ROOM HARNESS			
77G BG TO ENGINE ROOM HARNESS	23G	/R TO ENGINE ROOM HARNESS	76G	R/G	TO ENGINE ROOM HARNESS			
24G G/B TO ENGINE ROOM HARNESS COM HARNESS	24G	VR TO ENGINE ROOM HARNESS	176	BG	TO ENGINE ROOM HARNESS			

REAR FINAL DRIVE CONNECTORS - WITH Cummins 5.0L

< WIRING DIAGRAM >

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REAR FINAL DRIVE

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Revision: March 2016

M72	DIFFERENTIAL LOCK	MODE SWITCH	TH08FB-NH	BLACK			Ľ	4 3 2 1	- <u>-</u>	2 2 2			Signal Name		ILLUMINATION -		NOITINGI			DIFF LOCK ON SW	DIEFLOCK DEF SW		000	CAN CATEMAN						1 2 3 4 5 6	7 8 9 10 11 12			Cinnal Name		CAN 1 H	I	BATTERY	CAN 2 H	GND	CAN 3 H	CAN 1 L	1	IGNITION	CAN 2 L	GND	CAN 3 L	
or No.	or Name		or Type	or Color				_					Color of	MILE	5				-	0/5	; c	>	or No	or Nomo		or type								I Color of	Wire	-	1	BG		•		۹.	1	σ	æ	•	œ	
Connecte	Connecto		Connecto	Connecto			S H						Termina	, So	- •	4 6	, ,	t u	. «		. α	, ,	(toppand)			Connect				2				Termina	No.	-	2	e	4	5	9	2	80	6	10	=	12	
TO BODY HARNESS	I U BUUT HARNESS	TO BODY HARNESS		TO BODY HADNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS		021							5R 4K 3R 2R 1R	14R 13R 12R 11R 10R 9R 8R			Signal Name		TAIL LAMP 2	IGNITION	BALLERY	- DATTEDV	ALLERT	-	1 1		RATTERY	-	BATTERY	ACCESSODY	BATTERY	BATTERY	ACCESSORY					
SHIELD	ž	1	1 3	: 0	5 ≥	SHIELD	œ	_	R	ß	8	P		σ	B∕	L/B	W/L	٢		No.	- unclu						7R 6R	16R 15R			Color of	Wire	- !	6/H	Н/А	- 3	MUS				×		5a	2 a	_ ×	; >	- g/B	
81J	823	833	84.1	190	P28	88.	F68	r06	91J	92J	63,1	94J	959	696	ſ26	98,	L66	1001		Connector	Connortor	Connector	Connector		(44)		5				Terminal	No.	Ë	5	¥ Ę	Ŧ 0		82		5 8	108	118	act		87	158	161	
TO BODY HARNESS	I U BUUT HAHNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HADNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HANNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS TO RODY HARNESS	TO BODY HABNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS				
L L	6/0	BS -	2		g ≻	٩	G/R	ГG	SB	>	SB	-	· _	×	BR	BG	Ч	0	٧	BR	G/W	1	SHIELD	r -		∝ >	æ	8	1	SHIELD	ۍ ا	MA	-N	SHIELD	в	SHIELD	w	SHIELD	B/R	LVW	•	T	SHIELD	в	0	SHIELD	M	8
28J	580	301	100	221	34.1	35J	36J	37J	38J	39.1	401	41J	42.1	43.1	44J	45J	46J	47J	48J	49J	50.1	51J	52J	22	192	261	57J	58J	59J	601	61J	63.1	64J	65J	66J	F73	68J	C69	L07	L17	72J	73J	74.J	75J	76.1	F17	78.1	r 62
M40	WIRF TO WIRF	TH80FW-CS16-TM4	WHITE				11 21 31 41 31	50 /J 50 31 101	11.1 12.1 13.1 14.1 15.1 16.1 17.1 18.1 19.1 20.1 2.1.1	22J 23J 24J 25J 26J 27J 28J 29J 30J	24 25 25 25 25 25 26 26 27 20 20 20 27 27 27 27	213 223 333 343 353 354 373 354 354 414 414 414 414 424 424 414		51J 52J 53J 54J 55J 56J 56J 57J 58J 59J 60J 61J		71J 72J 73J 74J 75J 76J 77J 78J 78J 80J 81J	nne neo noo n ro noo neo neo neo neo	91J 92J 93J 94J 95J	971 981 999 1000				r of Signal Name	TO BODY HADNESS	V TO BODY HABNESS	TO BODY HARNESS	3 TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS TO BODY HARNESS	TO BODY HARNESS	B TO BODY HARNESS	B TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS	R TO BODY HARNESS	TO BODY HARNESS	TO BODY HARNESS								
ector No.	ector Name	ector Type	actor Color			U	į															-	ninal Coloi				u L/E	В	BB			В	IJ O/E	2J L	3J W	4J Y	51	8	2 2	B	°	D O/E	۲ ۲	-	N N	4J W/F	5	



< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

Connector No.		2	12	ω								
Connector Nam	e	∢	ð	ŝ	8	Ł	R	Ę	Ę	E		
Connector Type		-	F	Ē	≿	Ŧ						
Connector Colo	5	>	Ξ	벁								
E												
S H						I.	IV	17				
	5	7	10	0	œ	2	9	2	4	ŝ	2	
	24	23	3	51	20	19	8	17	16	15	4	13
		l										

Signal Name	GND	ITS CAN-H	IGN	BUZZER OUTPUT	ITS CAN-L	CAN-L	SW LED	ı	CAN-H	CAN-L	SW 1	-	1	ı	1		LED 1	CAN-H	1	1		1	BSW SW	
Color of Wire	8	_	σ	ßВ	æ	æ	G/R		_	٩	σ			ı			G/B	-		-		1	ГG	
Terminal No.	-	2	3	4	ŝ	9	7	80	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

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Wiring Diagram - VK56VD

INFOID:000000013776714





TO MAIN HARNESS	54J	-	TO MAIN HARNESS	Connector No	B77
TO MAIN HARNESS	55J	ж	TO MAIN HARNESS	Connector Name	DIFFEEDENITIAL
TO MAIN HARNESS	56J	×	TO MAIN HARNESS	CONNECTOR NAME	
TO MAIN HARNESS	57J	L/G	TO MAIN HARNESS		
TO MAIN HARNESS	58J	0	TO MAIN HARNESS	Connector lype	IH16FW-NH
TO MAIN HARNESS	59.1	1	TO MAIN HARNESS	Connector Color	WHITE
TO MAIN HARNESS	60J	SHIELD	TO MAIN HARNESS		
TO MAIN HARNESS	61J	σ	TO MAIN HARNESS		
TO MAIN HARNESS	62J	'	TO MAIN HARNESS	SH	
TO MAIN HARNESS	63.1	RW	TO MAIN HARNESS		1 2 3 4 5 6 7 8
TO MAIN HARNESS	64J	Z	TO MAIN HARNESS		9 10 11 12 13 14 15 16
TO MAIN HARNESS	65J	SHIELD	TO MAIN HARNESS		
TO MAIN HARNESS	66.1	8	TO MAIN HARNESS		
TO MAIN HARNESS	F29	SHIELD	TO MAIN HARNESS	Tominal Colo	26
TO MAIN HARNESS	68J	OL	TO MAIN HARNESS		Signal Name
TO MAIN HARNESS	691	SHIELD	TO MAIN HARNESS	>	SOI ENDID (+)
TO MAIN HARNESS	107	BR	TO MAIN HARNESS	- ~	SOLENOID (+)
TO MAIN HARNESS	L17	LVW	TO MAIN HARNESS	1 0	
TO MAIN HARNESS	72J	1	TO MAIN HARNESS	, ,	
TO MAIN HARNESS	L27	1	TO MAIN HARNESS	+ <i>u</i>	DIEE LOCK ON SW
TO MAIN HARNESS	13J	1	TO MAIN HARNESS	5	
TO MAIN HARNESS	74J	SHIELD	TO MAIN HARNESS		1
TO MAIN HARNESS	751	LG/B	TO MAIN HARNESS	~ 0	
TO MAIN HARNESS	76J	æ	TO MAIN HARNESS	~	CAN-H
TO MAIN HARNESS	F22	SHIELD	TO MAIN HARNESS	5 1 5 1	SULBALI
TO MAIN HARNESS	78.1	GR/B	TO MAIN HARNESS	10	GND
TO MAIN HARNESS	162	8	TO MAIN HARNESS	=	GND
TO MAIN HARNESS	80.1	×	TO MAIN HARNESS	12	DIFF LOCK POSITION SW
TO MAIN HARNESS	81J	SHIELD	TO MAIN HARNESS	13	-
TO MAIN HARNESS	82J	5	TO MAIN HARNESS	14	DIFF LOCK OFF SW
TO MAIN HARNESS	83J	1	TO MAIN HARNESS	cl cl	VBALL
TO MAIN HARNESS	84J	1	TO MAIN HARNESS	9I	CAN-L
TO MAIN HARNESS	85.1	Y/B	TO MAIN HARNESS		
TO MAIN HARNESS	86.1	σ	TO MAIN HARNESS		
TO MAIN HARNESS	F28	B/R	TO MAIN HARNESS		
TO MAIN HARNESS	88.1	SHIELD	TO MAIN HARNESS		
TO MAIN HARNESS	P68	GR/R	TO MAIN HARNESS		
TO MAIN HARNESS	106	-	TO MAIN HARNESS		
TO MAIN HARNESS	L19	L/B	TO MAIN HARNESS		
TO MAIN HARNESS	92J	ß	TO MAIN HARNESS		
TO MAIN HARNESS	93J	В	TO MAIN HARNESS		
TO MAIN HARNESS	94.)	L	TO MAIN HARNESS		
TO MAIN HARNESS	96.1	ΓG	TO MAIN HARNESS		
TO MAIN HARNESS	96.1	æ	TO MAIN HARNESS		
TO MAIN HARNESS	F26	B∧	TO MAIN HARNESS		
TO MAIN HARNESS	981	87	TO MAIN HARNESS		
TO MAIN HARNESS	r66	WL	TO MAIN HARNESS		
TO MAIN HARNESS	1001	ß	TO MAIN HARNESS		
TO MAIN HARNESS					



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BR/LG SB/BR

88 O/B

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LGV

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SB/O

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Signal Name	TO ENGINE ROOM HARNESS											
Color of Wire	Y	>	_	Γœ	R/G	SB	٩	٦	SHIELD	D/M	-	BR
Terminal No.	-	2	e	4	5	9	7	8	6	10	ŧ	12

O/B

20J 21J

19

Υ/R

22J

W/R

255 241 23

G/O ß g

38 29J 30.1 31J 32J 33J 36.1

G/R LG/B ß ۲Ľ H

> 38.1 39J 40 41J 42J 44J 45 46. 48J

37.1

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REAR FINAL DRIVE

< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

TO MAIN HARNESS TO MAIN HARNESS TO MAIN HARNESS TO MAIN HARNESS

SHIELD

55J 53J 53J

Y/GR

47J

8888 ₹ BR∕Y G/W

3 Y TO ENGINE ROOM HARNESS	4 W TO ENGINE ROOM HARNESS	5 LG TO ENGINE ROOM HARNESS	6 L TO ENGINE ROOM HARNESS				10 - IU ENGINE RUOM HAHNESS	11 - TO ENGINE ROOM HARNESS	12 R TO ENGINE ROOM HARNESS		Connector No. C23			Connector Type RH12FB	Connector Color BLACK			H.S.	6 5 4 3 2 1				Terminal Color of Signal Name	No. Wire Juguati Natille	1 L TO CHASSIS HARNESS	2 B TO CHASSIS HARNESS	3 - TO CHASSIS HARNESS	4 - IC CHASSIS HARNESS	6 L TO CHASSIS HARNESS	7 R TO CHASSIS HARNESS	8 Y TO CHASSIS HARNESS	9 – TO CHASSIS HARNESS	10 – TO CHASSIS HARNESS	11 W TO CHASSIS HARNESS 12 R TO CHASSIS HARNESS																	E
Connector No. C16	Connector Name DIFFEBENTIAL LOCK	POSITION SWITCH	Connector Type RS02FGY	Connector Color GRAV		IDD		H.S.	Ĵ.				Tourning Calar of	No Mire Signal Name					Connector No. C17	Connector Name DIFFERENTIAL LOCK	SOLENOID BUCCT	Connector lype HKUZFB	Connector Color BLACK			H.S.				Terminal Color of	No. Wire Signal Name	1 Y SOLENOID (+)	2 V SOLENOID (-)		Connector No. C20	Connector Name WIRE TO WIRE	Connector Type RH12MB				1.0.	7 8 0 10 11 12				No Mire Signal Name	WIE	1 L LO ENGINE HOUM HAHNESS	2 B TO ENGINE ROOM HARNESS		F G
TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS				I U ENGINE KOUM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS		TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS -	(WITH CUMMINS V8D)	TO ENGINE ROOM HARNESS - (WITH VK56VD)	TO ENGINE ROOM HARNESS -	(WITH CUMMINS V8D)	I U ENGINE RUOM HARNESS - (WITH VK56VD)	TO ENGINE ROOM HARNESS -		I U ENGINE RUCINI FIARNESS - (WITH VK56VD)	TO ENGINE ROOM HARNESS																J
22C SHIELD	23C G/B	24C G/B	25C W	50C	210	28C G/W	59C H/LG	30C R/L	31C	32C R	33C L/W	34C L	35C R/W	36C L	37C Y	38C GR	39C R	40C P	41C V	42C LG/B	43C Y/B	44C	490	46C BH	48C Y/R	49C R/Y		49C V	50C B		90C	51C V	- - -	2 0 0	52C V/W																k
5	WIRE TO WIRE	BK26EGV_BS20_Y6				4C 3C 2C 1C	100 ac ac 70 ac	20 20 20 20	0C 19C 18C 17C 16C 15C 14C 13C 12C		30C 29C 28C 27C 26C 25C 24C 23C 22C		10C 39C 38C 37C 36C 35C 34C 33C 32C		460 450	51C 50C 49C 48C			Signal Name	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	I O ENGINE ROOM HARNESS - (WITH CUMMINS V8D)	TO ENGINE ROOM HARNESS -	(WITH VK56VD)	10 ENGINE ROOM HAHNESS - (WITH CUMMINS V8D)	TO ENGINE ROOM HARNESS -	TO ENGINE POOM HADNESS	(WITH CUMMINS VBD)	TO ENGINE ROOM HARNESS -	TO ENGINE ROOM HARNESS -	(WITH CUMMINS V8D)	TO ENGINE ROOM HARNESS - (WITH VK56VD)	TO ENGINE ROOM HARNESS - (WITH CUMMINS VBD)	TO ENGINE ROOM HARNESS -	(WITH VK56VD)	TO ENGINE ROOM HARNESS	TO ENGINE POOM HAPNESS	TO ENGINE POOM HAPNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HABNESS			N				
onnector No.	onnoctor Name	onnector Type	onnoctor Color			50	H.S.	2	210/20		31C 31		41C 4(4/C	52C	J	erminal Color of	No. Wire	1C Y/V	2C W/L	3C B	4C BR/W	5C BR/Y	ec	7C G/H	7C R		в 	8C 0/B		900 M//L	9C SB	10C GR/R		10C GR	11C B	11C R/W	:	12C Y	140	140		17C V	18C BG	19C L	20C W	210	2		(

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< WIRING DIAGRAM >

[REAR FINAL DRIVE: MA248 (ELD)]

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	E51	WIRE TO WIRE	RH12FB	BLACK			R	6 5 4 3 7 1	12 11 10 9 8 7			Signal Name	TO CHASSIS HARNESS	TO CHASSIS HABNESS																								
	No.	Name	Type	Color							Color	Wire	-	8	æ	M	σ	-	œ		1	1	•	ď	•													
	Connector	Connector	Connector	Connector (ł	4444h	Ч	0			Terminal	No.	-	N	m	4	5	9	2	8	5	10	E	: :	4													
TO CHASSIS HABNESS	TO CHASSIS HARNESS - (WITH BULB CHECK)	TO CHASSIS HARNESS - (WITHOUT BULB CHECK)	TO CHASSIS HARNESS - (WITH CUMMINS V8D)	TO CHASSIS HARNESS - (WITH VK56VD)	TO CHASSIS HARNESS - (WITH CUMMINS V8D)	TO CHASSIS HARNESS - (WITH VK56VD)	TO CHASSIS HARNESS - (WITH CUMMINS V8D)	TO CHASSIS HARNESS - (WITH VK56VD)	TO CHASSIS HARNESS - (WITHOUT FFV)	TO CHASSIS HARNESS - (WITH FFV)	TO CHASSIS HARNESS																											
BG	8	SHIELD	G/B	GΛ	M	8	ГG	G/W	G/R	R/G	RL	8	н	LW	L	R/W	L	٢	BR	R	Р	^	G/B	Y/B	ж	σ	BR	В	Y/R	RM	>	8	ΒΛ	>	в	в	-	٨/٨
200	21C	22C	23C	24C	25C	26C	27C	28C	29C	29C	30C	31C	32C	33C	34C	35C	36C	37C	38C	39C	40C	41C	42C	43C	44C	45C	46C	47C	48C	49C	49C	50C	50C	51C	51C	52C	52C	52C

Connector	No. Name	E41 WIRE TO WIRE DK26MCV_DC20_YG
Connector	lype	RK26MGY-HS20-X6
Connector		GHAY
NHAN I	÷	30 30 40
H.S.	2 28	70 80 90 100 110
	12C	3C 14C 15C 16C 17C 18C 19C 20C 21C
	22C	3C 24C 25C 26C 27C 28C 29C 30C 31C
	32C	3C 34C 35C 36C 37C 38C 39C 40C 41C
	42C 48C	43C 44C 45C 46C 47C 49C 50C 51C 52C
Terminal No.	Color o Wire	f Signal Name
5	٨X	TO CHASSIS HARNESS
2C	W/L	TO CHASSIS HARNESS
ဗ္ဂ	8	TO CHASSIS HARNESS
4 2	BRW	TO CHASSIS HARNESS TO CHASSIS HARNESS
3	>	TO CHASSIS HARNESS
70	G/R	TO CHASSIS HARNESS - (WITH CUMMINS V8D)
70	œ	TO CHASSIS HARNESS - (WITH VK56VD)
ဗ္ဗ	m	TO CHASSIS HARNESS - (WITH CUMMINS V8D)
80	0/B	TO CHASSIS HARNESS - (WITH VK56VD)
96	MIL	TO CHASSIS HARNESS - (WITH CUMMINS V8D)
မိ	B	TO CHASSIS HARNESS - (WITH VK56VD)
100	GR/R	TO CHASSIS HARNESS - (WITH CUMMINS V8D)
100	GR	TO CHASSIS HARNESS - (WITH VK56VD)
11C	æ	TO CHASSIS HARNESS - (WITH CUMMINS V8D)
11C	R/W	TO CHASSIS HARNESS - (WITH VK56VD)
12C	۶	TO CHASSIS HARNESS
13C	8	TO CHASSIS HARNESS
14C	ß	TO CHASSIS HARNESS
150	~ a	TO CHASSIS HARNESS TO CHASSIS HARNESS
170	• >	TO CHASSIS HARNESS
18C	BG	TO CHASSIS HARNESS
19C	-	TO CHASSIS HARNESS



Signal Name	TO CHASSIS HARNESS												
Color of Wire	_	•	,	,	ГG	-	æ	æ			M	н	
Terminal No.	-	2	e	4	5	9	7	8	6	10	1	12	

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					2	2
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Ш	≥	ž	≥	I		
	Ĕ	ø	p			
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۶	P	5	P		_	
sct	sct	st	sct		ń	
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õ	õ	ß	Ö	F		
-	-	-	-			

Terminal No.	Color of Wire	Signal Name
-	>	TO BODY HARNESS
2	۷	TO BODY HARNESS
3	-	TO BODY HARNESS
4	w	TO BODY HARNESS
5	R/G	TO BODY HARNESS
9	SB	TO BODY HARNESS
7	Ч	TO BODY HARNESS
8	L	TO BODY HARNESS
6	SHIELD	TO BODY HARNESS
10	В	TO BODY HARNESS
11	н	TO BODY HARNESS

TO BODY HARNESS

BB

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REAR FINAL DRIVE CONNECTORS - WITH VK56VD

	AY OUT										ſſ	-	2	1			au			GND	TU4			a																									
BATTERY	BLOWER FAN REI		4		ITH TYPE A)							46 45 44 43 42 4	52 51 50 49 48 4				olgnal Nal	IGN	BAT	FUEL SENSOR	ILL CONT OUT	CAN-L	G1 G1	EUEL SENSC		,	M CAN-L	M CAN-H																					
Y/LG	M			NIC. 110		TH		COLOR						-		Color of	Wire	N	ж	٨٨	GR	₄.		BRV	-	1	ГG	SB																					
15P	16P		Connector		Connector	Connector		Connector	E B		H.S.					Terminal	No.	41	42	43	44	45	40	F 84	49	50	51	52																					
ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	001	ESS ESS	ESS								4, 10, 40	3P 2P 1P				Je			OUT			5								
TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN	TO MAIN HARN						1			P 4P	+111212141			Signal Nan	IGNITION	IGNITION	IGNITION RELAY	RR DEF RLY	RR DEF RLY	RR DEF RLY O	IGNITION	RATTERY	-	1	1	BATTERY	ВАПТЕРУ	
ŋ	W		œ	-	в	-	-	W/B	B/B	W/B	٩	-	σ	σ	٨/٧	BB	σ	σ	> -	H H	a a	GRW		M ON	Nomo El						7P 6P 5			-	Color of	a nie	. >	σ	B/W	B/W	0	s ع	* -	, ,	1	-	œ	>	
77G	78G	79G	80G	81G	82G	83G	84G	85G	86G	87G	88G	89G	900	91G	92G	93G	94G	95G	969	2/6	200	100G		Connector	Connoctor	Connector	Connector		(GAR)	U H	²				Terminal	-0N	2Р	3Р	4P	ξP	6P	d/	P B	10P	11P	12P	13P	14P	
MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HAHNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS	MAIN HARNESS						
TO	TO	10	1	TO	TO	10	10	10	10	10	10	TO	T0	10	10	2	5	10	2 4	2 2		2 2	10	TO	TO	10	5	2 2	2 2	10	TO	10	2	2 2	2 2	10	2		2 4	2 2	1	10	TO	10	2	2 2	CT	2	
G/B	R/W	œ	P	G/B	G/B	BR/Y	۵.	۹.	٦	æ	G/R	ß	RM	BB	B	'	RG	0	œ 2	Š C	5 <u>e</u>	2 @	>	1	BR	œ	-	> >	: J	>	>	BG	8	8	• ≥	æ	MIL	R/N	2 2	2 6	>		RW	2	SHIELD	* *	B/G		
24G	25G	26G	27G	28G	29G	30G	31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	41G	42G	43G	044	5004 1940	47G	48G	49G	50G	51G	52G	53G	220	56G	57G	58G	59G	60G	626	63G	64G	65G	50Q	9/9 986	969 69	70G	71G	72G	73G	75G	76G	2	
]		-				9		9		õ		é												Τ	Τ				Τ							Τ			Ŧ	2				
		E TO WIRE	0MW-CS16-TM4	ΠE				20 00 00 00 00			196 186 176 166 156 146 136 126	296286276266256246236226	396 386 376 366 356 346 336 326	49G48G47G48G45G44G43G42G	59G 58G 57G 56G 55G 54G 53G 52G	69G[68G 67G 66G 65G 64G 63G 62G	796 786 776 766 756 746 736 726 7	89G 88G 87G 86G 85G 84G 83G 82G	95G 94G 93G 92G ^{91G}	1006 996 986 976 966]				Signal Name	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS - (WI	TO MAIN LAPINES AND	VK56VD)	TO MAIN HARNESS																		
E15		ame WIF	rpe THE	olor WH							216/206	98	41G40G	500	61G 60G	202	816806	300						Color of	Wire	٥	B/R	W/B	BRW	NO NO D	×2	5	æ	×	R/G	BR	Y/B	G/W	σ	G√	1/5	GY	ΒΛ	G/R	20	3	Y/R		
nactor No		nector N	nector Ty	nector C	ſ	h L	S H																	rminal	No.	1G	2G	3G	4G	50	2G	8G	96	10G	11G	13G	14G	15G	16G	17G	190	20G	21G	22G	000	2	23G		



Revision: March 2016

2016 Titan NAM

< WIRING DIAGRAM >

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REAR FINAL DRIVE CONNECTORS - WITH VK56VD

			25G	MA	TO FNGINE ROOM HARNESS
Connector	No.	M31	26G	æ	TO ENGINE ROOM HARNESS
Connector	Name	WIRE TO WIRE	27G	ГG	TO ENGINE ROOM HARNESS
Connector	Type	TH80FW-CS16-TM4	28G	G/B	TO ENGINE ROOM HARNESS
Connector	Color	WHITE	29G	G/B	TO ENGINE ROOM HARNESS
			30G	BR/Y	TO ENGINE ROOM HARNESS
			31G	В	TO ENGINE ROOM HARNESS
SH			32G	ж	TO ENGINE ROOM HARNESS
		16 26 36 46 ⁵⁶	33G	Y/L	TO ENGINE ROOM HARNESS
		6G 7G 8G 9G 10G	34G	GR	TO ENGINE ROOM HARNESS
			35G	G/R	TO ENGINE ROOM HARNESS
		116 126 136 146 156 156 176 186 196 206 216	36G	SB	TO ENGINE ROOM HARNESS
Ĺ		2202302402503502702502702503300	37G	R/W	TO ENGINE ROOM HARNESS
		316 326 336 346 356 366 376 386 396 406 416	38G	BR	TO ENGINE ROOM HARNESS
		42G43G44G45G46G47G48G49G50G	39G	BR	TO ENGINE ROOM HARNESS
		51G52G53G54G55G56G57G58G59G60G61G	40G	-	TO ENGINE ROOM HARNESS
		626636466566666676886696706	41G	R/G	TO ENGINE ROOM HARNESS
		71G72G73G74G75G76G76G77G78G73G80G81G	42G	0	TO ENGINE ROOM HARNESS
		82G83G84G85G86G87G88G83G90G	43G	G	TO ENGINE ROOM HARNESS
			44G	RM	TO ENGINE ROOM HARNESS
		916 926 936 946 956	45G	G	TO ENGINE ROOM HARNESS
		36G 97G 98G 99G 100G	46G	٦C	TO ENGINE ROOM HARNESS
]	47G	ж	TO ENGINE ROOM HARNESS
			48G	M	TO ENGINE ROOM HARNESS
			49G	ı	TO ENGINE ROOM HARNESS
Terminal	Color o		50G	BR	TO ENGINE ROOM HARNESS
No.	Wire	Signal Name	51G	ж	TO ENGINE ROOM HARNESS
16	σ	TO ENGINE ROOM HARNESS	52G	٦	TO ENGINE ROOM HARNESS
2G	B/B	TO ENGINE ROOM HARNESS	53G	M	TO ENGINE ROOM HARNESS
g	N	TO ENGINE ROOM HARNESS	54G	M	TO ENGINE ROOM HARNESS
4G	BR/W	TO ENGINE ROOM HARNESS	55G	σ	TO ENGINE ROOM HARNESS
56	BR	TO ENGINE ROOM HARNESS	56G	W	TO ENGINE ROOM HARNESS
99	RW	TO ENGINE ROOM HARNESS	57G	٢	TO ENGINE ROOM HARNESS
7G	>	TO ENGINE ROOM HARNESS	58G	BG	TO ENGINE ROOM HARNESS
98	σ	TO ENGINE ROOM HARNESS	59G	BG	TO ENGINE ROOM HARNESS
96	œ	TO ENGINE ROOM HARNESS	60G	BG	TO ENGINE ROOM HARNESS
10G	N	TO ENGINE ROOM HARNESS	61G	0	TO ENGINE ROOM HARNESS
11G	R/G	TO ENGINE ROOM HARNESS	62G	W	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS	63G	0	TO ENGINE ROOM HARNESS
13G	ВВ	TO ENGINE ROOM HARNESS	64G	WL	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS	65G	W/R	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS	66G	BG	TO ENGINE ROOM HARNESS
16G	σ	TO ENGINE ROOM HARNESS	67G	0	TO ENGINE ROOM HARNESS
17G	0	TO ENGINE ROOM HARNESS	68G	в	TO ENGINE ROOM HARNESS
18G	G√	TO ENGINE ROOM HARNESS	69G	Y	TO ENGINE ROOM HARNESS
19G	٨X	TO ENGINE ROOM HARNESS	70G	-	TO ENGINE ROOM HARNESS
20G	G∕Y	TO ENGINE ROOM HARNESS	71G	R/W	TO ENGINE ROOM HARNESS
21G	ΒΛ	TO ENGINE ROOM HARNESS	72G	LW	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS -	73G	SHIELD	TO ENGINE ROOM HARNESS
		(WITH CUMMINS VBD)	74G	×	TO ENGINE ROOM HARNESS

REAR FINAL DRIVE

-					-						_		_				_		_			
TO ENGINE ROOM HARNESS																						
۹.	-	н		œ	-	-	W	B/R	×	σ	Ч	U	Ч	٨/٧	BR	•	ŋ	œ	œ	W/B	н	GR/W
78G	79G	80G	81G	82G	83G	84G	85G	86G	87G	88G	89G	90G	91G	92G	93G	94G	95G	96G	97G	98G	99G	100G

TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS

BG R/G R ≪

74G 75G 76G 77G

TO ENGINE ROOM HARNESS -(WITH VK55VD) TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS

R/H G/B Ş

23G 22G

AADIA1170GB

International integra	33 38	G/0	TO BODY HARNESS TO BODY HARNESS	821	SHIELD	TO BODY HARNESS TO BODY HARNESS	Connector No Connector Na	M70 me FUSE	BLOCK (J/B)
Image: state	301	SB	TO BODY HARNESS TO DODY HARNESS	831	'	TO BODY HARNESS	Connector Tvr	De NS16	FBR-CS
		3	TO DODY HARNESS	040	- 3	TO BODT HARNESS	Connector		NN I
	33.1	- 98	TO BODY HARNESS	198	s (TO RODY HARNESS			NA
(1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	34.1	>	TO BODY HARNESS	87.1	>	TO BODY HARNESS			
Image:	35J	•	TO BODY HARNESS	88	SHIELD	TO BODY HARNESS			
	36J	G/R	TO BODY HARNESS	68	œ	TO BODY HARNESS		7R 6R 5R	4K 3R 2R 1
Bit Control Co	37J	LG	TO BODY HARNESS	106	-	TO BODY HARNESS	16	5R 15R 14R	13R 12R 11R 10R 9R 8
(1) (1) <td>38J</td> <td>ß</td> <td>TO BODY HARNESS</td> <td>F16</td> <td>L/B</td> <td>TO BODY HARNESS</td> <td>]</td> <td></td> <td>-</td>	38J	ß	TO BODY HARNESS	F16	L/B	TO BODY HARNESS]		-
Implementation Impleme	391	>	TO BODY HARNESS	P76	SB	TO BODY HARNESS			
Microsoft Mic	40,1	- BS	TO RODY HARNESS	83.1	. a	TO BODY HARNESS			
Instrumentation (highlingingingingingingingingingingingingingi	41J		TO BODY HARNESS	94,1	P	TO BODY HARNESS	Terminal Co	olor of	Signal Name
	101	-	TO BODY HABNESS	1 50	-	TO BODY HABNESS	No.	Wire	
Multiplication Image Construentesso Construentesso </td <td>43.1</td> <td>. ></td> <td>TO RODY HARNESS</td> <td>- I'yo</td> <td></td> <td>TO BODY HARNESS</td> <td>H H</td> <td>L</td> <td>TAIL LAMP 2</td>	43.1	. >	TO RODY HARNESS	- I'yo		TO BODY HARNESS	H H	L	TAIL LAMP 2
Matrix (Matrix) Matrix Matrix Matrix Matrix Matrix Matrix Matrix Mat		: 6	TO DODY HADRIESS		2		2R	G/R	IGNITION
Implementation Impleme				C/e	- (}		38	Y/R	BATTERY
Image:	P ⁶⁴	BG	I U BUDY HAHNESS	196	8	I U BUDT HARNESS	4R	-	-
Imilial Imilial Imilial Imilial Imilial Imilial Imilial Imilial Imiliar Imiliar <t< td=""><td>46J</td><td></td><td>TO BODY HARNESS</td><td>166</td><td>WL</td><td>TO BODY HARNESS</td><td>85</td><td>></td><td>BATTERY</td></t<>	46J		TO BODY HARNESS	166	WL	TO BODY HARNESS	85	>	BATTERY
Initialization Initialion Initialization Initializat	C/4	5	10 BUDY HAHNESS	MUL	*	I U BULT HAHNESS	68	G/W	ACCESSORY
Non-transmission Connector Namesi (0) Connector Nam	481	>	TO BODY HARNESS	-1			78	,	
Bigling limits Connector Names Exame Descrivations Signal Name 50	49)	BB	TO BODY HARNESS	- Connecto	or No. N	160	88		1
Bytal Bytal <th< td=""><td>207</td><td>Ø</td><td>TO BODY HARNESS</td><td>- Connecto</td><td>or Name F</td><td>USE BLOCK (J/B)</td><td>86</td><td></td><td>-</td></th<>	207	Ø	TO BODY HARNESS	- Connecto	or Name F	USE BLOCK (J/B)	86		-
Signal Name	51J	1	TO BODY HARNESS		F			M	DATTEDV
DUC DUC <td>52J</td> <td>SHIELD</td> <td>TO BODY HARNESS</td> <td>Connecti</td> <td>or type</td> <td>1500FW-C3</td> <td>118</td> <td>× '</td> <td></td>	52J	SHIELD	TO BODY HARNESS	Connecti	or type	1500FW-C3	118	× '	
Distributions Distribu	53J	œ	TO BODY HARNESS	Connectu	or Color V	VHITE			RATTEDV
DBOY HAMRESS DBOY HAMRESS<	54J	L	TO BODY HARNESS	E			120	2 9	ACCESSODV
DEDYTHAMERS DED Matrix DED DED Matrix DED DED <th< td=""><td>55J</td><td>æ</td><td>TO BODY HARNESS</td><td></td><td></td><td></td><td>401 141</td><td>2</td><td>BATTERV</td></th<>	55J	æ	TO BODY HARNESS				401 141	2	BATTERV
DEODY HAMRESS 5/3 R TO BODY HAMRESS 5/3 R TO BODY HAMRESS 5/3 R TO BODY HAMRESS 5/3 T <td>261</td> <td>></td> <td>TO BODY HARNESS</td> <td>- H.S.</td> <td></td> <td>2T 1T</td> <td>158</td> <td>, ,</td> <td>BATTERY</td>	261	>	TO BODY HARNESS	- H.S.		2T 1T	158	, ,	BATTERY
OD DOT HAMESS DODY HAMESS D0 DOT HAMESS S0 1 D DODY HAMESS S0 2 D DODY HAMESS S0 2 D DODY HAMESS S0 2 D DODY HAMESS S0 2 D DOTY HAMESS S1 2 D D DOTY HAMESS S1 2 D D DOTY HAMESS S1 2	57J	œ	TO BODY HARNESS			2T 2T 3T 3T	16R	G/B	ACCESSORY
ODOT HAMESS OD COT HAMESS OD COT HAMESS OD COT HAMESS ODOT HAMESS 0007 HAMESS 01007 HAMESS 01007 HAMESS 01007 HAMESS 01 1 1 01007 HAMESS 01007 HAMESS 01 1 1 01007 HAMESS 01007 HAMESS 0207 HAMESS 02 1 0007 HAMESS 01007 HAMESS 0207 HAMESS 0207 HAMESS 0207 HAMESS 01007 HAMESS 0207 HAMESS 0207 HAMESS 0207 HAMESS 01007 HAMESS 0307 HAMESS 0307 HAMESS 0307 HAMESS 01007 HAMESS 0307 HAMESS 04007 HAMESS 04007 HAMESS 01007 HAMESS 0307 HAMESS 04007 HAMESS 04007 HAMESS 01007 HAMESS 70 0307 HAMESS 07 0307 HAMESS 01007 HAMESS 70 0307 HAMESS 07	180	2	10 BOUY HAHNESS	-					
DID/HARKES DID/HARKES DID/HARKES DID/HARKES DID/HARKES DID/HARKES DID/HARKES E0 TO BO/HARKES DID/HARKES E0 TO BO/HARKES DID/HARKES E0 TO BO/HARKES DID/HARKES E3 TO BO/HARKES E43 J.W TO BO/HARKES DID/HARKES E3 TO BO/HARKES E43 J.W TO BO/HARKES DID/HARKES E3 DID/HARKES E43 J.W TO BO/HARKES DID/HARKES E3 DID/HARKES DID/HARKES E3 DID/HARKES DID/HARKES E3 NHELD TO BO/HARKES DID/HARKES E4 TO BO/HARKES T DID/HARKES E4 TO BO/HARKES T DID/HARKES T T B T DID/HARKES T T B T DID/HARKES T T B T DID/HARKES T T		-							
ODO/ HANKESS CI TOBO/ HANKESS Terminal Color of signal Mane 0607 HANKESS Eg T T 0607 HANKESS Signal Mane 0607 HANKESS Eg LW T06007 HANKESS Signal Mane No. 0607 HANKESS Eg LW T06007 HANKESS Signal Mane Signal Mane 0607 HANKESS Eg UW T06007 HANKESS Signal Mane T - - 0607 HANKESS Eg UW T06007 HANKESS Signal Mane Signal Mane 0607 HANKESS Eg Signal Mane T - - - 0607 HANKESS Eg W T06007 HANKESS T - - - 0607 HANKESS Eg W T06007 HANKESS T - - - - 0607 HANKESS T UW T06007 HANKESS T - - - - - - - - - - - - - - <td>609</td> <td>SHIELD</td> <td>TO BODY HARNESS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	609	SHIELD	TO BODY HARNESS						
BODY HANKESS E2J - TO BODY HANKESS No Wine Stgnal Name BODY HANKESS EdJ LW TO BODY HANKESS EdJ LW TO BODY HANKESS Signal Name BODY HANKESS EdJ LW TO BODY HANKESS EdJ LW TO BODY HANKESS Signal Name BODY HANKESS EdJ LW TO BODY HANKESS Signal Name T Signal Name BODY HANKESS EdJ LW TO BODY HANKESS T Signal Name T T Signal Name BODY HANKESS EdJ TO BODY HANKESS T DS BODY HANKESS T Signal Name T	61)	σ	TO BODY HARNESS	Terminal	Color of				
0 DODY HARKESS 63.1 R/W T O BODY HARKESS T 0 64.1 L/W T 0 BODY HARKESS 63. JHIED T 0 BODY HARKESS 7 B B ATTERY 0 BODY HARKESS 63. SHIED T 0 BODY HARKESS 7 B B ATTERY 0 BODY HARKESS 63. SHIED T 0 BODY HARKESS 7 B B ATTERY 0 BODY HARKESS 63. SHIED T 0 BODY HARKESS 7 C B 0 BODY HARKESS 63. SHIED T 0 BODY HARKESS 7 C C BATTERY 0 BODY HARKESS 70. B-R T 0 BODY HARKESS FT C C C 0 BODY HARKES 70. B-R T 0 BODY HARKESS FT C C C C 1 BODY HARKES 7.0 B-R T 0 BODY HARKESS FT C C C C C C C C C C C C C C C	62J	1	TO BODY HARNESS	No.	Wire	Signal Name			
DBODY HARKESS G4J LW T0 BODY HARKESS ST SB BATTERY BODY HARKESS 643 BHLED T0 BODY HARKESS FT SB BATTERY BODY HARKESS 653 BHLED T0 BODY HARKESS FT R RATERY BODY HARKESS 651 BHLED T0 BODY HARKESS FT R RATERY BODY HARKESS 631 SHELD T0 BODY HARKESS FT C BATTERY BODY HARKESS 631 W T0 BODY HARKESS FT C BATTERY BODY HARKESS 73 SHELD T0 BODY HARKESS FT C BATTERY BODY HARKES 73 U U T0 BODY HARKES FT C	63J	RW	TO BODY HARNESS	ļ					
DBOY HARLESS EGJ SHELD TO BODY HARLESS ZT SB BATTERY 0 BODY HARLESS EGJ B TO BODY HARLESS EGJ B TO BODY HARLESS 0 BODY HARLESS EGJ B TO BODY HARLESS FT R BATTERY 0 BODY HARLESS EGJ SHELD TO BODY HARLESS FT C BATTERY 0 BODY HARLESS EGJ BHELD TO BODY HARLESS FT C BATTERY 0 BODY HARLESS TJJ LW TO BODY HARLESS FT C BATTERY 0 BODY HARLESS TJJ LW TO BODY HARLESS FT C C C 0 BODY HARLESS TJJ LW TO BODY HARLESS FT C	64J	ΓM	TO BODY HARNESS			-			
OBOY HARLESS 66. B TO BODY HARLESS BT TO BODY HARLESS 0 BODY HARLESS 65. SHELD TO BODY HARLESS G ATTERY 0 BODY HARLESS 68. N TO BODY HARLESS G ATTERY 0 BODY HARLESS 68. N TO BODY HARLESS G ATTERY 0 BODY HARLESS 70. BrR TO BODY HARLESS G G ATTERY 70. BrR TO BODY HARLESS 70. BrR TO BODY HARLESS GT - - 70. BrR TO BODY HARLESS 71. L/W TO BODY HARLESS GT - - 70. BrR TO BODY HARLESS 71. L/W TO BODY HARLESS -	65J	SHIELD	TO BODY HARNESS	51	BS	BAITERY			
000 HANKES 00 0 <th< td=""><td>1 33</td><td></td><td></td><td>31</td><td>æ</td><td>RR DEF RLY</td><td></td><td></td><td></td></th<>	1 33			31	æ	RR DEF RLY			
OBOY HARKES OFT - - - 0 BOY HARKES 63 W TO BOY HARKES FT - - 0 BOY HARKES 63 W TO BOY HARKES FT - - - 0 BOY HARKES 7u B/R TO BOY HARKES FT - - - 0 BOY HARKES 7u B/R TO BOY HARKES FT - - - 0 BOY HARKES 7u LW TO BOY HARKES FT - - - 0 BOY HARKES 7u LW TO BOY HARKES - TO BOY HARKES - - - 0 BOY HARKES 7u F L TO BOY HARKES -	129	o Hel	TO DODY HADRIESS	4T	5	BATTERY			
ODOVI HARNESS W N O BODY HARNESS 6T 1 D BODY HARNESS 0 BODY HARNESS 6B, BHELD 10 BODY HARNESS 7U BHE 10 BODY HARNESS 0 BODY HARNESS 7U Br 10 BODY HARNESS 7U Br 10 BODY HARNESS 0 BODY HARNESS 7U LW 10 BODY HARNESS 7U Br 10 BODY HARNESS 0 BODY HARNESS 7U LW 10 BODY HARNESS 7U 2D 2 10 BODY HARNESS 1 20 DODY HARNESS 72J - 10 BODY HARNESS 72J - 10 BODY HARNESS 1 20 DODY HARNESS 73 - 10 BODY HARNESS 72J - 10 BODY HARNESS 1 20 DOT HARNESS 75J R 10 BODY HARNESS 72J R 10 BODY HARNESS 1 20 DOT HARNESS 72J R 10 BODY HARNESS 72J R 10 BODY HARNESS 1 20 DOT HARNESS 72J B 10 BODY HARNESS 72J R 10 BODY HARNESS 1 20 DOT HARNESS				- 5T	ı	I			
OBOV HARNESS TO BODY HARNESS TO BODY HARNESS 0 BODY HARNESS TU D BODY HARNESS 70 BODY HARNESS TU LW TO BODY HARNESS 71 BL LW TO BODY HARNESS TU 72 BL L TU BL TO BODY HARNESS 72 BL - TO BODY HARNESS TU 72 BL - TO BODY HARNESS TU 72 BL - TO BODY HARNESS TU 73 BL - TO BODY HARNESS TU 73 BL - TO BODY HARNESS TO BODY HARNESS 74 B R TO BODY HARNESS TO BODY HARNESS 75 BODY HARNESS TA TO BODY HARNESS TO BODY HARNESS 75 BODY HARNESS TA TO BODY HARNESS TO BODY HARNESS 75 BODY HARNESS TO BODY HARNESS TO BODY HARNESS TO BODY HARNESS 75 BODY HARNESS TO BODY HARNESS TO BODY HARNESS TO BODY HARNESS 75 BODY HARNESS TO BODY HARNESS TO BODY HARNESS TO BODY HARNESS 73 B	199	M	I O BODY HARNESS	- 6T	ı	1			
OBOUT HAINLESS 7.01 B/H TO BOOT HAINLESS 7.00 DONT HAINLESS 1.0W TO BOOT HAINLESS 7.01 L/W TO BOOT HAINLESS 7.2 7.01 L/W TO BOOT HAINLESS 7.3 7.01 B/HELD TO BOOT HAINLESS 7.3 7.31 L TO BOOT HAINLESS 7.3 7.31 HIELD TO BOOT HAINLESS 7.3 7.31 B/HELD TO BOOT HAINLESS 7.3 7.32 DOOT HAINLESS 7.3 M 7.3 7.31 B/HELD TO BOOT HAINLESS 7.3 7.3 7.32 B/HELD TO BOOT HAINLESS 7.3 7.3 7.31 W TO	691	SHIELU	10 BODY HAHNESS						
0 BODY HARKESS 71.J LW TO BODY HARKESS 72.J - TO BODY HARKESS 72.J 0 BODY HARKESS 72.J - TO BODY HARKESS 73.J - TO BODY HARKESS 73.J 0 BODY HARKESS 73.J - TO BODY HARKESS 74.J SHIELD TO BODY HARKESS 75.J 0 BODY HARKESS 75.J R TO BODY HARKESS 75.J R TO BODY HARKESS 75.J 0 BODY HARKESS 73.J SHIELD TO BODY HARKESS 75.J B TO BODY HARKESS 73.J 77.J SHIELD TO BODY HARKESS 73.J 73.J W TO BODY HARKESS 73.J 73.J W TO BODY HARKESS 73.J 73.J J J TO BODY HARKESS 73.J W TO BODY HARKES 73.J	7 02	B/B	TO BODY HARNESS						
0 BODY HARNESS 72J - TO BODY HARNESS 0 BODY HARNESS 73J - TO BODY HARNESS 7 BODY HARNESS 73J - TO BODY HARNESS 0 BODY HARNESS 73J SHIED TO BODY HARNESS 7 BODY HARNESS 75J R TO BODY HARNESS 7 BODY HARNESS 76J 0 TO BODY HARNESS 7 BODY HARNESS 76J 0 TO BODY HARNESS 7 BODY HARNESS 77J SHIELD TO BODY HARNESS 7 BODY HARNESS 73J B TO BODY HARNESS 7 BODY HARNESS 73J B TO BODY HARNESS			TO BODY HARNESS						
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REAR FINAL DRIVE CONNECTORS - WITH VK56VD

Revision: March 2016

2016 Titan NAM

REAR FINAL DRIVE

< WIRING DIAGRAM >

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Revision: March 2016

< WIRING DIAGRAM >

Connector No	M70	15
CONTRACTOR NO.	INI 2	16
Connector Name		2
		17
		18
Connector Type	TH08FB-NH	19
Connector Color	BLACK	20
		21
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SH		23
	4 3 2 1	24
	8 7 6 5	

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DLN-238

Signal Name	GND	ITS CAN-H	IGN	BUZZER OUTPUT	ITS CAN-L	ITS CAN-L	SW LED	1	CAN -H	CAN-L	SW 1	1	1	1
Color of Wire	8	٦	σ	GR	щ	æ	G/R	I	L	Ч	ŋ	ı	-	ı
Terminal No.	-	2	e	4	5	9	7	80	6	10	11	12	13	14
										Ał	ADI	A11	72	GB

LED 1	ITS CAN-H	1	-	-	-	SW	I
G/B	-	1			ī	ГG	ī
17	18	19	20	21	22	23	24

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

DETAILED FLOW

1.INTERVIEW FROM THE CUSTOMER

Clarify customer complaints before inspection. First of all, perform an interview utilizing DLN-240, "Diagnostic Work Sheet" and reproduce symptoms as well as fully understand it. Ask customer about his/her complaints carefully. Check symptoms by driving vehicle with customer, if necessary. CAUTION:

Customers are not professional. Never guess easily like "maybe the customer means that...," or "maybe the customer mentions this symptom".

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe function. Refer to DLN-220, "Fail-Safe".

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3.PERFORM SELF DIAGNOSTIC RESULT

Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is any DTC detected?

YES >> Record or print self-diagnosis results. GO TO 4.

NO >> GO TO 6.

4.RECHECK SYMPTOM

Erase "Self Diagnostic Result" mode of "DIFF LOCK". 1.

Perform DTC confirmation procedures for the malfunctioning system.

NOTE:

If some DTCs are detected at the same time, determine the order for performing the diagnosis based on DLN-M 220, "DTC Inspection Priority Chart".

Is any DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-43, "Intermittent Incident".

5. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

· Repair or replace the malfunctioning parts.

Reconnect part or connector after repairing or replacing.

When DTC is detected, erase "Self Diagnostic Result" mode of "DIFF LOCK".

>> GO TO 7.

Ó.IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Estimate malfunctioning system based on symptom diagnosis and perform inspection. Can the error-detected system be identified?

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[REAR FINAL DRIVE: MA248 (ELD)]

YES >> GO TO 7.

NO >> Check harness and connectors based on the information obtained by interview. Refer to <u>GI-43</u>, <u>"Intermittent Incident"</u>.

7.FINAL CHECK

- 1. Check the reference value for differential lock control unit.
- 2. Recheck the symptom and check that symptom is not reproduced on the same conditions.

Is the symptom reproduced?

YES >> GO TO 3.

NO >> Inspection End.

Diagnostic Work Sheet

INFOID:000000013478007

Description

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

Interview sheet sample

		Interview sheet					
Customer	MR/MS	Registration Initial year number registration					
name		Vehicle type VIN					
Storage date		Engine Mileage km (Mi	le)				
		Differential lock indicator lamp does not turn ON with differential lock mode switch O	N.				
		Differential lock indicator lamp flashes while driving.					
Symptom		□Noise □Vibration					
		□Others ()					
First occurrence		□Recently □Others ()					
Frequency of occurrence		□Always □Under a certain conditions of □Sometimes (time(s)/day)					
		Dirrelevant					
Climate con-	Weather	□Fine □Cloud □Rain □Snow □Others ()					
ditions	Temperature	□Hot □Warm □Cool □Cold □Temperature [Approx. °C(°F)]					
	Relative humidity	□High □Moderate □Low					
Road conditions		□Urban area □Suburb area □High way □Mounting road (uphill or down hill) □Rough road					
Operation conditions, etc.		□Irrelevant □When engine starts □During idling □During driving □During acceleration □At constant speed driving □During deceleration □During cornering (right curve or left curve)					

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTIO	BASIC INSPECTION >		[REAR FINAL DRIV	/E: MA248 (EL	.D)]
		Interview sh	neet		
Customer	MR/MS	Registration number	Initial year registration		
name		Vehicle type	VIN		
Storage date		Engine	Mileage	km (🛛 🛚	/lile)
Other conditions					(
Memo					
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P1836 DIFFERENTIAL LOCK CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

DTC/CIRCUIT DIAGNOSIS P1836 DIFFERENTIAL LOCK CONTROL UNIT

DTC Description

INFOID:000000013478429

DTC DETECTION LOGIC

Malfunction is detected in the memory (EEPROM) system of differential lock control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	When ignition switch is ON.	
D1926	CONTROL UNIT 3	Signal (terminal)	—	
F 1030	(Control unit 3)	Threshold	—	
		Diagnosis delay time	_	

POSSIBLE CAUSE

Internal malfunction of differential lock control unit.

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch ON.
- 2. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1836" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-242, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478430

1.PERFORM SELF DIAGNOSTIC RESULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to <u>DLN-242, "DTC Description"</u>. <u>Is DTC "P1836" detected?</u>

- YES >> Replace differential lock control unit. Refer <u>DLN-281, "Removal and Installation"</u>.
- NO >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace the malfunctioning parts.

P1838 DIFFERENTIAL LOCK MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P1838 DIFFERENTIAL LOCK MODE SWITCH

DTC Description

INFOID:000000013478431

[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

More than two switch inputs are simultaneously detected due to short circuit of differential lock mode switch.

DTC No.	CONSULT screen terms		DTC detection condition	С
			When ignition switch is ON	
		Signal (terminal)	Differential lock mode switch (terminal 5 and 14)	
P1838	ON SW (Differential lock ON switch)	Threshold		DLN
	(Diagnosis delay time		
POSSIBLE C • Malfunction o • Malfunction o • Internal malf FAIL-SAFE When different	AUSE of differential lock mode sw of differential lock mode sw unction of differential lock of tial lock system is malfund	vitch vitch circuit control unit ctioning, fail-safe sta	atus activates and rear differential lock is disen-	F
gageo.				
DTC CONFIF	RMATION PROCEDURE			Н
1.PRECOND	ITIONING			
If "DTC CONF wait at least 10	IRMATION PROCEDURE') seconds before conducting	has been previousl ng the next test.	y conducted, always turn ignition switch OFF and	
>> G(O TO 2.			
2.DTC REPR	ODUCTION PROCEDURI	Ξ		J
CONSULT 1. Start the e CAUTION Stop the v 2. Operate d 3. Select "Se Is DTC "P1838 YES >> Pr NO-1 >> To	ngine. : /ehicle. ifferential lock mode switch iff Diagnostic Result" mode <u>3" detected?</u> oceed to diagnosis proced oceck malfunction sympto	n to each position. e of "DIFF LOCK". ure. Refer to <u>DLN-2</u> om before repair: Re	4 <u>3, "Diagnosis Procedure"</u> . fer to <u>GI-43, "Intermittent Incident"</u> .	K L M
NO-2 >> Co	onfirmation after repair: Ins	pection End.		
Diagnosis F	Procedure		INFOID:000000013478432	N
1.CHECK DIF	FERENTIAL LOCK MOD	E SWITCH		IN
Check differen Is the inspection YES >> Go NO >> Re	tial lock mode switch. Refe on result normal? O TO 2. eplace differential lock mod	er to <u>DLN-245, "Com</u> le switch.	nponent Inspection".	0 P
2.CHECK IG	NITION VOLTAGE FOR D	FFERENTIAL LOC	K MODE SWITCH	
1. Turn the ig 2. Disconnec	nition switch OFF. t differential lock mode sw	itch harness connec	ctor.	

3. Check the voltage between differential lock mode switch harness connector and ground.

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P1838 DIFFERENTIAL LOCK MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential loc	ck mode switch		Voltage
Connector	Terminal		(Approx.)
M72	4	Ground	0 V

4. Turn the ignition switch ON.

CAUTION:

Never start the engine.

5. Check the voltage between differential lock mode switch harness connector and ground.

Differential loc	ck mode switch		Voltage
Connector	Terminal		(Approx.)
M72	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK IGNITION SIGNAL CIRCUIT FOR DIFFERENTIAL LOCK MODE SWITCH

1. Turn the ignition switch OFF.

2. Check fuse [No. 31 located in the fuse block (J/B)].

- 3. Disconnect fuse block (J/B) harness connector.
- Check the continuity between differential lock mode switch harness connector and fuse block (J/B) harness connector.

Differential loc	ck mode switch	Fuse bl	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
M72	4	M4	7P	Yes

5. Check the continuity between differential lock mode switch harness connector and the ground.

Differential loc	ck mode switch		Continuity	
Connector	Terminal		Continuity	
M72	4	Ground	No	

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-13</u>, "Wiring Diagram - <u>BATTERY POWER SUPPLY - WITH Cummins 5.0L -</u>".

NO >> Repair or replace the malfunctioning parts.

4.CHECK DIFFERENTIAL LOCK MODE SWITCH SIGNAL

1. Turn the ignition switch OFF.

- 2. Connect differential lock mode switch harness connector.
- 3. Disconnect differential lock control unit harness connector.
- 4. Turn the ignition switch ON. CAUTION:

Never start the engine.

5. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Condition	
Connector	Terminal			(Approx.)
	5	- Ground -	Differential lock mode switch: ON	Battery voltage
B77	0		Differential lock mode switch: OFF	0 V
	14		Differential lock mode switch: ON	0 V
			Differential lock mode switch: OFF	Battery voltage

Is the inspection result normal?

Revision: March 2016

P1838 DIFFERENTIAL LOCK MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

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INFOID-000000013478433

YES >> GO TO 5. NO >> GO TO 6.

5.CHECK DIFFERENTIAL LOCK MODE SWITCH SIGNAL CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Disconnect differential lock mode switch harness connector.

 Check the continuity between differential lock control unit harness connector and differential lock mode switch harness connector.

Differential lo	ck control unit	Differential loc	k mode switch	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
B77	5	-	7	Yes	
			8	No	
	44	WI72	7	No	E
	14		8	Yes	

4. Check the continuity between differential lock control unit harness connector and ground.

Differential lock control unit			Continuity		
Connector Terminal					
077	5		Orrent	No	
B//	14	Ground	NO		
the increation regult n	armal2	1	1	Н	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning parts.

6.CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector.
Check differential lock mode switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.

NO >> Repair or replace the malfunctioning parts.

Component Inspection

1. CHECK DIFFERENTIAL LOCK MODE SWITCH

1. Turn the ignition switch OFF.

2. Remove differential lock mode switch.

3. Check the continuity between differential lock mode switch connector terminals.

Differential lock mode switch Terminal		Condition	Continuity	N
		Condition	Continuity	IN
	7	Differential lock mode switch: ON	Yes	
4 –	I	Differential lock mode switch: OFF	No	0
	٥	Differential lock mode switch: ON	No	
	0	Differential lock mode switch: OFF	Yes	

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace differential lock mode switch.

P1839 DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1839 DIFFERENTIAL LOCK POSITION SWITCH

DTC Description

INFOID:000000013478434

DTC DETECTION LOGIC

When differential lock position switch is ON, rotation difference occurs in wheel speed (rear wheel right and left).

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
POSI SW ON (Differential lock position switch ON)	Diagnosis condition	Engine running and vehicle running		
	POSI SW ON (Differential lock position switch ON)	Signal (terminal)	Differential lock position switch (terminal 12)	
		Threshold	—	
		Diagnosis delay time	—	

POSSIBLE CAUSE

- Malfunction of differential lock position switch
- Malfunction of differential lock position switch circuit
- Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Start the engine.
- 2. Turn the differential lock mode switch ON.
- 3. Drive at 20km/h (12 MPH) or less for approx. 1 minute on the curved road.
- 4. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1839" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-246, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478435

1.CHECK DIFFERENTIAL LOCK POSITION SWITCH GROUND CIRCUIT

Check the continuity between differential lock position switch harness connector and ground.

- 1. Turn the ignition switch OFF.
- 2. Disconnect differential lock position switch harness connector.
- 3. Check the continuity between differential lock position switch harness connector and ground.

Differential lock	position switch		Continuity	
Connector	Terminal		Continuity	
C16	2	Ground	Yes	

Is the inspection result normal?

YES >> GO TO 2.

P1839 DIFFERENTIAL LOCK POSITION SWITCH

[REAR FINAL DRIVE: MA248 (ELD)] < DTC/CIRCUIT DIAGNOSIS > NO >> Repair or replace the malfunctioning parts. 2.check differential lock position switch signal circuit А 1. Disconnect differential lock control unit harness connector. Check the continuity between differential lock control unit harness connector and differential lock position 2. В switch harness connector. Differential lock control unit Differential lock position switch Continuity Connector Terminal Connector Terminal B77 C16 12 1 Yes DLN Check the continuity between differential lock control unit harness connector and ground. 3. Differential lock control unit Continuity Ε Connector Terminal B77 12 Ground No Is the inspection result normal? F YES >> GO TO 3. NO >> Repair or replace the malfunctioning parts. $\mathbf{3}$.check differential lock position switch signal 1. Connect differential lock control unit harness connector. 2. Turn the ignition switch ON. Н CAUTION: Never start the engine. Check the voltage between differential lock position switch harness connector and ground. 3 Differential lock position switch Voltage (Approx.) Connector Terminal C16 1 Ground Battery voltage Is the inspection result normal? YES >> GO TO 4. K NO >> Repair or replace the malfunctioning parts. 4.CHECK DIFFERENTIAL LOCK POSITION SWITCH Check differential lock position switch. Refer to DLN-247, "Component Inspection". Is the inspection result normal? YES >> GO TO 5. M NO >> Replace differential lock position switch. Refer to DLN-283, "Removal and Installation". ${f 5}.$ CHECK TERMINALS AND HARNESS CONNECTORS · Check differential lock control unit pin terminals for damage or loose connection with harness connector. Ν Check differential lock position switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace differential lock control unit. Refer to DLN-281, "Removal and Installation".

NO >> Repair or replace the malfunctioning parts.

Component Inspection

1.CHECK DIFFERENTIAL LOCK POSITION SWITCH

1. Turn the ignition switch OFF.

2. Remove differential lock position switch. Refer to DLN-283, "Removal and Installation". INFOID:000000013478436

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P1839 DIFFERENTIAL LOCK POSITION SWITCH

Continuity

Yes

No

< DTC/CIRCUIT DIAGNOSIS >

Differential lock position switch

Terminal

1

3. Check the continuity between differential lock position switch connector terminals.

Condition

While pulling rod (A) of differential lock posi-

While pushing rod (A) of differential lock posi-

(Differential system is locked state.)

(Differential system is unlocked state.)

[REAR FINAL DRIVE: MA24	48 (ELD)]
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Is the inspection result normal?

tion switch

tion switch

YES >> Inspection End.

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>> Replace differential lock position switch. Refer to DLN-283, "Removal and Installation". NO

< DTC/CIRCUIT DIAGNOSIS >

P1844 RELAY

DTC Description

DTC DETECTION LOGIC

Differential lock control unit detects as irregular by comparing target value with monitor value.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
		Diagnosis condition	When ignition switch is ON.
	RFLAY	Signal (terminal)	_
P1844	(Relay)	Threshold	
		Diagnosis delay time	_
POSSIBLE C. Internal malfur	AUSE action of differential lock co	ntrol unit	
FAIL-SAFE When different gaged.	tial lock system is malfund	ctioning, fail-safe sta	atus activates and rear differential lock is disen-
DTC CONFIF	MATION PROCEDURE		
1.PRECOND	ITIONING		
If "DTC CONFI wait at least 10	IRMATION PROCEDURE"	' has been previousl ng the next test.	y conducted, always turn ignition switch OFF and
>> GO 2.DTC REPR	O TO 2. ODUCTION PROCEDUR	Ē	
CONSULT Turn the ig Select "Se <u>Is DTC "P1844</u> YES >> Pr NO-1 >> To NO-2 >> Co 	gnition switch OFF to ON. If Diagnostic Result" mode <u>" detected?</u> oceed to diagnosis proced o check malfunction sympto onfirmation after repair: Ins	e of "DIFF LOCK". lure. Refer to <u>DLN-2</u> om before repair: Re pection End.	<u>49, "Diagnosis Procedure"</u> . fer to <u>GI-43, "Intermittent Incident"</u> .
Diagnosis F	Procedure		INFOID:000000013478438
1 .CHECK PC	WER SUPPLY AND GRO	UND CIRCUIT	
Perform the tro	ouble diagnosis of the pov	wer supply and grou	ind circuit. Refer to <u>DLN-273, "Diagnosis Proce-</u>
Is the inspectic	on result normal?		
YES >> GO	O TO 2.		
NO >> Re	epair or replace the malfun	ctioning parts.	
∠.CHECK TE	RMINALS AND HARNESS	6 CONNECTORS	
Check differen	tial lock control unit pin ter	minals for damage of	or loose connection with harness connector.
Is the inspectic	on result normal?		

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INFOID:000000013478437

P1848 DIFFERENTIAL LOCK SOLENOID

DTC Description

INFOID:000000013478439

[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

An open was detected in the differential lock solenoid or circuit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
P1848	SOL DISCONNECT (Solenoid disconnect)	Diagnosis condition	When all of the following conditions are satisfied:When ignition switch is ON.Differential lock mode switch: ON	
		Signal (terminal)	Differential lock solenoid (terminal 1 and 2)	
		Threshold	—	
		Diagnosis delay time	—	

POSSIBLE CAUSE

- Internal malfunction of differential lock solenoid
- Malfunction of differential lock solenoid circuit (open)
- · Malfunction of differential lock solenoid command current
- Differential lock solenoid relay does not switch to ON position.

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON.

CAUTION:

Never start the engine.

- 2. Turn the differential lock mode switch ON.
- 3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1848" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-250, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478440

1. CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY VOLTAGE

- 1. Turn the ignition switch OFF.
- 2. Check the voltage between differential lock control unit harness connector and ground.

Differential lo	ck control unit		Voltage	
Connector	Terminal		(Approx.)	
B77	9	Ground	Battery voltage	

3. Turn the ignition switch ON. CAUTION:

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P1848 DIFFERENTIAL LOCK SOLENOID

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

Never start the engine.

4. Check the voltage between differential lock control unit harness connector and ground.

	ck control unit			Voltage	
Connector	Terminal			(Approx.)	
B77	9	Ground	Battery voltage		
s the inspection result ne	ormal?				
YES >> GO TO 3.					
NO >> GO TO 2.					
CHECK DIFFERENTI	AL LOCK SOLENOID PO	WER SUPPLY CIRC	UIT		
1. Turn the ignition swit	ch OFF.				
2. Check the 10A fuse	(#64). ok box I H connector				
Letter Check the continuity	between differential lock	control unit harness	connector and fu	usible link box LH h	
ness connector.					
Different	ial lock control unit	Fusible	link box LH	Continuity	
Connector	Terminal	Connecto	r Terminal		
B77	9	E27 (Cummins	5.0L) 1	Yes	
		E148 (VK56VD) 3		
Check the continuity	between differential lock of	control unit harness of	connector and th	e ground.	
Differential Ic	ck control unit	Co		Continuity	
Connector	Terminal			Continuity	
B77	9	Ground		No	
s the inspection result no	ormal?				
YES >> Perform the	trouble diagnosis for pow	er supply circuit. Re	fer to <u>PG-13, "V</u>	Viring Diagram - B/	
	<u>ER SUPPLY - WITH CL</u> PRIX WITH VK56VD "	<u>1111 1111 1111 1111111111111111111111</u>	<u>PG-34, "Wiring</u>	Diagram - BATTE	
NO >> Repair or rep	blace the malfunctioning p	arts.			
2. Check the continuity	between differential lock (control unit harness o	connector and or	ound	
			g.		
Differential ic	ck control unit			0 // //	
Connector	ck control unit Terminal	—		Continuity	
Connector	nck control unit Terminal 10	_		Continuity	
Connector B77	ck control unit Terminal 10 11	Ground		Continuity Yes	
Connector B77	nck control unit Terminal 10 11 ormal?	Ground		Continuity Yes	
Connector B77 s the inspection result no YES >> GO TO 4	rck control unit Terminal 10 11 Drmal?	Ground		Continuity Yes	
Connector B77 <u>s the inspection result no</u> YES >> GO TO 4. NO >> Repair or rep	Terminal 10 11 2rmal?	Ground		Continuity Yes	
Connector B77 <u>s the inspection result no</u> YES >> GO TO 4. NO >> Repair or rep 1. CHECK DIFFERENTI	Terminal	Ground arts. RCUIT		Continuity Yes	
Connector B77 <u>s the inspection result no</u> YES >> GO TO 4. NO >> Repair or rep 1 .CHECK DIFFERENTI Check the resistance bet	Terminal	Ground arts. RCUIT	nector.	Continuity Yes	
Connector B77 s the inspection result no YES >> GO TO 4. NO >> Repair or rep 4.CHECK DIFFERENTI Check the resistance bet	Terminal 10 11 2007 11 11 2007 11 2007 10 10 11 2007 10 11 2007 200	 Ground arts. RCUIT trol unit harness coni	nector.	Continuity Yes	
Connector B77 s the inspection result no YES >> GO TO 4. NO >> Repair or rep 4.CHECK DIFFERENTI Check the resistance bet	Differential lock control unit	— Ground arts. RCUIT trol unit harness coni	nector.	Continuity Yes Resistance	
Connector B77 s the inspection result no YES >> GO TO 4. NO >> Repair or rep CHECK DIFFERENTI Check the resistance bet	Terminal	Ground arts. RCUIT trol unit harness coni	nector.	Continuity Yes Resistance (Approx.)	

2 B77 1 3.8 Ω Is the inspection result normal?

P1848 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 6. NO >> GO TO 5.

5.CHECK HARNESS FOR DIFFERENTIAL LOCK SOLENOID CIRCUIT

- 1. Remove differential lock solenoid harness connector.
- 2. Check the continuity between differential lock control unit harness connector and differential lock solenoid harness connector.

Differential lock control unit		Differential lock solenoid		Continuity
Connector	Terminal	Connector	onnector Terminal	
B 77	1	C17	1	Vec
DII	2	017	2	165

3. Check the continuity between differential lock control unit harness connector and the ground.

Differential lo	ck control unit		Continuity	
Connector	Terminal			
B77	1	Ground	No	
	2	Gibuna	INO	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning parts.

6.CHECK DIFFERENTIAL LOCK SOLENOID

Check differential lock solenoid. Refer to <u>DLN-252, "Component Inspection"</u>.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to <u>DLN-292, "Disassembly and Assembly"</u>.

7. CHECK TERMINALS AND HARNESS CONNECTORS

• Check differential lock control unit pin terminals for damage or loose connection with harness connector.

• Check differential lock solenoid pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> After erasing the DTC, perform DTC confirmation procedure again. If DTC "P1848" is detected, replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.
- NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478441

1. CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

- 1. Turn the ignition switch OFF.
- 2. Disconnect differential lock solenoid harness connector.
- Apply 12 V to differential lock solenoid connector #1 (-) and #2 (+) terminals.
 CAUTION:
 - Never make the terminals short.
 - Connect the fuse between differential lock solenoid connector terminals.

Does differential lock solenoid operate?

YES >> GO TO 2.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to <u>DLN-292, "Disassembly and Assembly"</u>.

2.CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

1. Turn the ignition switch OFF.

2. Check the resistance between differential lock solenoid harness connector terminals.

DLN-252
P1848 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential	Resistance (Approx.)	A	
Terr			
1	3.2 Ω	F	
s the inspection result normal?			

YES >> Inspection End.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to <u>DLN-292, "Dis-</u> <u>assembly and Assembly"</u>.

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P1849 DIFFERENTIAL LOCK SOLENOID

DTC Description

INFOID:000000013478442

[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

A short was detected in the differential lock solenoid internal circuit or in the harness.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
	P1849 SOL SHORT (Solenoid short)	Diagnosis condition	When all of the following conditions are satisfied:When ignition switch is ON.Differential lock mode switch: ON
P1849		Signal (terminal)	Differential lock solenoid (terminal 1 and 2)
		Threshold	_
		Diagnosis delay time	—

POSSIBLE CAUSE

- Internal malfunction of differential lock solenoid
- · Malfunction of differential lock solenoid circuit (short)

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON. CAUTION:

Never start the engine.

- 2. Turn the differential lock mode switch ON.
- 3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1849" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-254</u>, "Diagnosis Procedure".
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478443

1. CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY VOLTAGE

- 1. Turn the ignition switch OFF.
- 2. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage
Connector	Terminal		(Approx.)
B77	9	Ground	Battery voltage

3. Turn the ignition switch ON. CAUTION:

Never start the engine.

4. Check the voltage between differential lock control unit harness connector and ground.

P1849 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

Differential lo	ck control unit	Voltage		/oltage
Connector	Terminal	—	(<i>F</i>	Approx.)
B77	9	Ground	Batte	ery voltage
s the inspection result no YES >> GO TO 3. NO >> GO TO 2. CHECK DIFFERENTIA	AL LOCK SOLENOID PC	WER SUPPLY CIRCUIT		
 Turn the Ignition switt Check the 10A (#64) Disconnect fusible lin Check the continuity 	cn OFF. ik box LH harness conne between differential lock	ctor. control unit harness conne	ctor and grou	nd.
Differential lo	ock control unit	Fusible link box L	Н	Continuity
Connector	Terminal	Connector	Terminal	Continuity
B77	9	E27 (Cummins 5.0L)	1	Yes
511	Ŭ	E148 (VK56VD)	3	
Check the continuity	between differential lock	control unit harness conne	ector and the g	ground.
Differential loo	ck control unit	_	C	ontinuity
	Terminal			-
Connector				
B77 the inspection result no YES >> Perform the TERY POWI POWER SUP NO >> Repair or rep	9 brmal? trouble diagnosis for pow ER SUPPLY - WITH Cu PPLY - WITH VK56VD -". lace the malfunctioning p	Ground /er supply circuit. Refer to ummins 5.0L -" or PG-34 arts.	9 <u>PG-13, "Wiri</u> 4, "Wiring Dia	No ng Diagram - agram - BATT
B77 S the inspection result no YES >> Perform the TERY POWI POWER SUF NO >> Repair or rep CHECK DIFFERENTIA . Turn the ignition switt . Check the continuity	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH CH PPLY - WITH VK56VD -". place the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock	Ground ver supply circuit. Refer to <u>ummins 5.0L -"</u> or <u>PG-34</u> arts. IT GROUND control unit harness conne	PG-13, "Wiri 4. "Wiring Dia ector and grou	No ng Diagram - agram - BATT nd.
B77 Sthe inspection result no YES >> Perform the TERY POWI POWER SUF NO >> Repair or rep CHECK DIFFERENTIA . Turn the ignition swite . Check the continuity Differential lo	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH Cu PPLY - WITH VK56VD -". place the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock ck control unit	Ground ver supply circuit. Refer to ummins 5.0L -" or PG-34 arts. IT GROUND control unit harness conne	PG-13, "Wiri 4, "Wiring Dia ector and grou	No ng Diagram - agram - BATT nd.
B77 the inspection result no YES >> Perform the <u>TERY POWI</u> <u>POWER SUF</u> NO >> Repair or rep CHECK DIFFERENTI, Turn the ignition switt Check the continuity Differential lo	9 <u>prmal?</u> trouble diagnosis for pow <u>ER SUPPLY - WITH Cr</u> <u>PPLY - WITH VK56VD -"</u> . place the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock <u>ck control unit</u> <u>Terminal</u>	Ground ver supply circuit. Refer to ummins 5.0L -" or PG-34 arts. IT GROUND control unit harness conne	PG-13, "Wiri 4, "Wiring Dia ector and grou	No ng Diagram - agram - BATT nd. ontinuity
B77 S the inspection result no YES >> Perform the TERY POW POWER SUF NO >> Repair or rep CHECK DIFFERENTI, Turn the ignition switt Check the continuity Differential lo Connector B77	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH Cr PPLY - WITH VK56VD -". blace the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock ck control unit Terminal 10 11	Ground ver supply circuit. Refer to ummins 5.0L -" or PG-34 arts. IT GROUND control unit harness conne — Ground	PG-13, "Wiri 4, "Wiring Dia ector and grou	No ng Diagram - agram - BATT nd. ontinuity Yes
B77 S the inspection result no YES >> Perform the TERY POWI POWER SUF NO >> Repair or rep CHECK DIFFERENTIA . Turn the ignition switt . Check the continuity Differential low Connector B77 S the inspection result no YES >> GO TO 4. NO >> Repair or rep .CHECK DIFFERENTIA	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH Cr PPLY - WITH VK56VD -". blace the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock ck control unit Terminal 10 11 prmal? blace the malfunctioning p AL LOCK SOLENOID CIF	Ground ver supply circuit. Refer to ummins 5.0L -" or PG-34 arts. IT GROUND control unit harness conne Ground arts. RCUIT	PG-13, "Wiri 4, "Wiring Dia ector and grou	No ng Diagram - agram - BATT nd. ontinuity Yes
B77 S the inspection result no YES >> Perform the TERY POWI POWER SUF NO >> Repair or rep CHECK DIFFERENTIA . Turn the ignition switt . Check the continuity Differential lo Connector B77 S the inspection result no YES >> GO TO 4. NO >> Repair or rep .CHECK DIFFERENTIA S the resistance between	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH Cr PPLY - WITH VK56VD -". place the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock ck control unit Terminal 10 11 prmal? place the malfunctioning p AL LOCK SOLENOID CIF ween differential lock con	Ground ver supply circuit. Refer to ummins 5.0L -" or PG-34 arts. IT GROUND control unit harness connectone Ground arts. RCUIT trol unit harness connecto	PG-13, "Wiri 4, "Wiring Dia ector and grou	No ng Diagram - agram - BATT nd. ontinuity Yes
B77 the inspection result no YES >> Perform the TERY POWI POWER SUF NO >> Repair or rep CHECK DIFFERENTIA Turn the ignition swite Check the continuity Differential lo Connector B77 the inspection result no YES >> GO TO 4. NO >> Repair or rep CHECK DIFFERENTIA Sthe k the resistance between	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH Cr PPLY - WITH VK56VD -". place the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock ck control unit Terminal 10 11 prmal? place the malfunctioning p AL LOCK SOLENOID CIF ween differential lock control unit Differential lock control unit	Ground ver supply circuit. Refer to <u>ummins 5.0L -"</u> or PG-34 arts. IT GROUND control unit harness connecton Ground arts. RCUIT trol unit harness connector	PG-13, "Wiri 4, "Wiring Dia ector and grou Co	No <u>ng Diagram -</u> agram - BATT nd. ontinuity Yes tance (Approx)
B77 S the inspection result no YES >> Perform the TERY POWI POWER SUF NO >> Repair or rep CHECK DIFFERENTIA . Turn the ignition switt . Check the continuity Differential lo Connector B77 S the inspection result no YES >> GO TO 4. NO >> Repair or rep .CHECK DIFFERENTIA . CHECK DIFFERENTIA . CHECK DIFFERENTIA . CHECK DIFFERENTIA	9 prmal? trouble diagnosis for pow ER SUPPLY - WITH Ci PPLY - WITH VK56VD -". blace the malfunctioning p AL LOCK CONTROL UN ch OFF. between differential lock ck control unit Terminal 10 11 prmal? blace the malfunctioning p AL LOCK SOLENOID CIF ween differential lock con Differential lock control unit Te	Ground ver supply circuit. Refer to <u>ummins 5.0L -"</u> or <u>PG-34</u> arts. IT GROUND control unit harness connecton Ground arts. RCUIT trol unit harness connector rminal	PG-13, "Wiri 4, "Wiring Dia ector and grou Co r. Resist	No ng Diagram - agram - BATT nd. ontinuity Yes tance (Approx.)

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DLN-255

P1849 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

- 1. Remove differential lock solenoid harness connector.
- Check the continuity between differential lock control unit harness connector and differential lock solenoid harness connector.

Differential lo	ck control unit	Differential lock solenoid		Continuity
Connector	Terminal	Connector Terminal		Continuity
R 77	1	C17	1	Ves
DIT	2	017	2	165

3. Check the continuity between differential lock control unit harness connector and the ground.

Differential lock control unit			Continuity	
Connector	Terminal		Continuity	
	1	Ground	No	
	2	Cibund	110	

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Repair or replace the malfunctioning parts.

6.CHECK DIFFERENTIAL LOCK SOLENOID

Check differential lock solenoid. Refer to DLN-256, "Component Inspection".

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to <u>DLN-292</u>, "Disassembly and Assembly".

7. CHECK TERMINALS AND HARNESS CONNECTORS

- Check differential lock control unit pin terminals for damage or loose connection with harness connector.
- Check differential lock solenoid pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

- YES >> After erasing the DTC, perform DTC confirmation procedure again. If DTC "P1849" is detected, replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.
- NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478444

1. CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

- 1. Turn the ignition switch OFF.
- 2. Disconnect differential lock solenoid harness connector.
- Apply 12 V to differential lock solenoid connector #1 (-) and #2 (+) terminals.
 CAUTION:
 - Never make the terminals short.
 - Connect the fuse between differential lock solenoid connector terminals.

Does differential lock solenoid operate?

- YES >> GO TO 2.
- NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to <u>DLN-292, "Disassembly and Assembly"</u>.

2. CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

- 1. Turn the ignition switch OFF.
- 2. Check the resistance between differential lock solenoid harness connector terminals.

Differential	Resistance	
Terr	(Approx.)	
1	2	3.2 Ω

P1849 DIFFERENTIAL LOCK SOLENOID

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> Inspection End.

NO >> Differential lock solenoid is malfunctioning. Replace differential assembly. Refer to <u>DLN-292, "Dis-assembly and Assembly"</u>.

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P1850 DIFFERENTIAL LOCK CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

P1850 DIFFERENTIAL LOCK CONTROL UNIT

DTC Description

INFOID:000000013478445

DTC DETECTION LOGIC

When differential lock mode switch is ON and difference between request current and actual current more than threshold.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	When all of the following conditions are satisfied:When ignition switch is ON.Differential lock mode switch: ON
P1850	P1850 (Solenoid current)	Signal (terminal)	_
	Threshold	_	
		Diagnosis delay time	—

POSSIBLE CAUSE

- Internal malfunction of differential lock control unit
- · Malfunction of differential lock solenoid circuit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON. CAUTION:

Never start the engine.

- 2. Turn the differential lock mode switch ON.
- 3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1850" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-258, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43. "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478446

1.CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

Check differential lock solenoid circuit. Refer to DLN-250, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning parts.

2.PERFORM SELF DIAGNOSTIC RESULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to <u>DLN-258, "DTC Description"</u>. <u>Is DTC "P1850" detected?</u>

DLN-258

P1850 DIFFERENTIAL LOCK CONTROL UNIT GNOSIS > [REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace differential lock control unit. Refer <u>DLN-281, "Removal and Installation"</u>.
- NO >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace the malfunctioning parts.

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P1856 VDC SYSTEM

DTC Description

INFOID:000000013478447

[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

Malfunction is detected in VDC system that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	Engine running and vehicle running
D1956	5 VDC SYSTEM (VDC system)	Signal (terminal)	VDC malfunction signal
P 1000		Threshold	-
			—

POSSIBLE CAUSE

VDC system malfunction

FAIL-SAFE

No impact to vehicle behavior. (Differential lock system can operate.)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Drive at 30 km/h (19 MPH) or more for approximately 1 minute.
- 2. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P1856" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-260, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478448

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-55, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector. Is inspection result normal?

- YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC "P1856" is detected, replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.
- NO >> Repair or replace the malfunctioning parts.

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY IIT DIAGNOSIS > [REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

DTC Description

INFOID:000000013478449

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DTC DETECTION LOGIC

When engine is running and differential lock solenoid power supply and ignition signal voltage is higher than 9 V and differential lock mode switch ON, differences between ignition signal voltage and differential lock solenoid power supply voltage higher than 4.6 V.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	When all of the following conditions are satisfied:When Ignition switch is ON.Differential lock mode switch: ON	
P18CB	PLY (Solenoid power supply)	Signal (terminal)	 Ignition signal (terminal 7) Solenoid power supply (terminal 9)	E
		Threshold	-	_
		Diagnosis delay time	—	

POSSIBLE CAUSE

- Malfunction of differential lock solenoid power supply or ignition signal voltage circuit (short)
- · Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disen-

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

1. Turn the ignition switch OFF to ON. CAUTION:

Never start the engine.

- 2. Turn the differential lock mode switch ON.
- 3. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18CB" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-261, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

1.CHECK IGNITION SIGNAL VOLTAGE

- 1. Turn the ignition switch OFF.
- 2. Disconnect differential lock control unit harness connector.
- 3. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage
Connector	Terminal		(Approx.)
B77	7	Ground	0 V

INFOID:000000013478450

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[REAR FINAL DRIVE: MA248 (ELD)]

- Turn the ignition switch ON.
 CAUTION: Never start the engine.
- 5. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage
Connector	Terminal		(Approx.)
B77	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK IGNITION SIGNAL CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check fuse [No. 30 located in the fuse block (J/B)].
- 3. Disconnect fuse block (J/B) harness connector.
- 4. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lo	Differential lock control unit		Fuse block (J/B)		
Connector	Terminal	Connector Terminal		Continuity	
B77	7	M4	7P	Yes	

5. Check the continuity between differential lock control unit harness connector and the ground.

Differential lock control unit			Continuity
Connector	Terminal	_	Continuity
B77	7	Ground	No

Is the inspection result normal?

YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to <u>PG-13. "Wiring Diagram -</u> <u>BATTERY POWER SUPPLY - WITH Cummins 5.0L -"</u>.

NO >> Repair or replace the malfunctioning parts.

$\mathbf{3}$.check differential lock solenoid power supply voltage

1. Turn the ignition switch OFF.

2. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage
Connector	Terminal		(Approx.)
B77	9	Ground	Battery voltage

3. Turn the ignition switch ON. CAUTION:

Never start the engine.

4. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage
Connector	Terminal		(Approx.)
B77	9	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY CIRCUIT

DLN-262

P18CB DIFFERENTIAL LOCK SOLENOID POWER SUPPLY

[REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

1. 2. 3. 4.	Turn the ignition swit Check the 10A fuse (Disconnect fusible lir Check the continuity ness connector.	ch OFF. (#64). hk box LH connector. between differential lock	control	unit harness conne	ector and fu	sible link box LH har-	A
	Different	ial lock control unit		Fusible link bo	x LH	Ocationity	
-	Connector	Terminal		Connector	Terminal	Continuity	С
D 77			E27 (Cummins 5.0L)	1			
	B//	9		E148 (VK56VD)	3	Yes	
5.	Differential lo	ck control unit	control			continuity	E
_	Connector	Terminal				Continuity	
	B77	9		Ground		No	
<u>Is the</u> YE	e inspection result no S >> Perform the <u>TERY POW</u> <u>POWER SUI</u>	ormal? trouble diagnosis for pov ER SUPPLY - WITH C PPLY - WITH VK56VD -".	wer sup	ply circuit. Refer to <u>s 5.0L -"</u> or <u>PG-34</u>	<u>PG-13, "W</u> , "Wiring [<u>'iring Diagram - BAT-</u> Diagram - BATTERY	F
NO	>> Repair or rep	place the malfunctioning p	oarts.				
J.C	HECK DIFFERENTI	AL LOCK CONTROL UN	IIT GRO	DUND			

- 1. Turn the ignition switch OFF.
- 2. Check the continuity between differential lock control unit harness connector and ground.

Differential lock control unit			Continuity	I
Connector	Terminal		Continuity	
R77	10	Ground Yes	Vac	J
	11	Giodila	165	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning parts.

6. CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector. Is the inspection result normal?

YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. When DTC Μ "P18CB" is detected, replace differential lock control unit. Refer to DLN-281, "Removal and Installation".

>> Repair or replace the malfunctioning parts. NO

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P18CC WHEEL SPEED SIGNAL

DTC Description

INFOID:000000013478451

[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

Malfunction is detected in wheel speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
	P18CC WHEEL SPEED SIGNAL (Wheel speed signal)	Diagnosis condition	Engine running and vehicle running	
B1900		Signal (terminal)	Each wheel speed signal	
FIOCC		Threshold	—	
		Diagnosis delay time	—	

POSSIBLE CAUSE

ABS malfunction

Wheel speed signal error

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Drive at 30 km/h (19 MPH) or more for approximately 1 minute.
- 2. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18CC" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-264, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43</u>, "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478452

1. PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS

Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-55</u>, "<u>DTC Index</u>".

NO >> GO TO 2.

2.CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector. Is inspection result normal?

- YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC "P18CC" is detected, replace differential lock control unit. Refer to <u>DLN-281</u>, "Removal and Installation".
- NO >> Repair or replace the malfunctioning parts.

P18CD SELF SHUTDOWN

DTC Description

[REAR FINAL DRIVE: MA248 (ELD)]

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INFOID:000000013478453

DTC DETECTION LOGIC В When ignition switch is ON, self-shut down of differential lock control unit was incomplete. CONSULT screen terms DTC No. DTC detection condition (Trouble diagnosis content) When Ignition switch is ON. Diagnosis condition INCOMPLETE SELF SHUT-Power supply for control unit (back-up) (terminal 15) DLN Signal (terminal) P18CD DOWN Threshold ____ (Incomplete self shutdown) Diagnosis delay time ____ Ε POSSIBLE CAUSE Malfunction of differential lock control unit power supply circuit (open or short) Battery power supply Internal malfunction of differential lock control unit When battery is less than 6.5V at cranking, P18CD may be recorded However, no impact to vehicle behavior will result.(Differential lock system will operate) FAIL-SAFE When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged. Н DTC CONFIRMATION PROCEDURE 1.PRECONDITIONING If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test. >> GO TO 2. 2.DTC REPRODUCTION PROCEDURE Turn the ignition switch ON. 1. Select "Self Diagnostic Result" mode of "DIFF LOCK". 2. Is DTC "P18CD" detected? YES >> Proceed to diagnosis procedure. Refer to <u>DLN-265, "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident". NO-2 >> Confirmation after repair: Inspection End. M Diagnosis Procedure INFOID:000000013478454 Ν 1. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY VOLTAGE 1. Turn the ignition switch OFF. Check the voltage between differential lock control unit harness connector and ground. 2. 3. Turn the ignition switch ON. CAUTION: **NEVER start the engine** Ρ Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage
Connector	Terminal		(Approx.)
B77	15	Ground	Battery voltage

Is the inspection result normal?

P18CD SELF SHUTDOWN

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check fuse [No. 6 located in the fuse block (J/B)].
- 3. Disconnect fuse block (J/B) harness connector.
- 4. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lo	Differential lock control unit		Fuse block (J/B)	
Connector	Terminal	Connector Terminal		Continuity
B77	15	M70	15R	Yes

5. Check the continuity between differential lock control unit harness connector and the ground.

Differential lock control unit			Continuity	
Connector	Terminal		Continuity	
B77	15	Ground	No	

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>PG-13</u>, "Wiring Diagram <u>BAT-</u> <u>TERY POWER SUPPLY - WITH Cummins 5.0L -"</u>.
- NO >> Repair or replace the malfunctioning parts.

3.CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND

- 1. Turn the ignition switch OFF.
- 2. Check the continuity between differential lock control unit harness connector and ground.

Differential lock control unit			Continuity	
Connector	Terminal		Continuity	
B77	10	Ground	Vas	
	11	Ground	163	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning parts.

4.CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector. <u>Is the inspection result normal?</u>

- YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. When DTC "P18CD" is detected, replace differential lock control unit. Refer to <u>DLN-281</u>, "<u>Removal and Instal-</u> <u>lation</u>".
- NO >> Repair or replace the malfunctioning parts.

P18CE DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

P18CE DIFFERENTIAL LOCK POSITION SWITCH

DTC Description

INFOID:000000013478455

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[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

When differential lock position switch is OFF, rotation fixing occurs in wheel speed (rear wheel right and left).

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Engine running and vehicle running	
P18CE DIFF LO SWITCH (Differen switch)	SWITCH	Signal (terminal)	Differential lock position switch (terminal 12)	DLN
	(Differential lock position	Threshold	—	
	SWITCH)	Diagnosis delay time	—	_

POSSIBLE CAUSE

- Malfunction of differential lock position switchMalfunction of differential lock position switch circuit
- Internal malfunction of differential lock control unit

FAIL-SAFE

When	differential	lock	system	is	malfunctioning,	fail-safe	status	activates	and	rear	differential	lock is	disen-	G
gaged														

DTC CONFIRMATION PROCEDURE	
1.PRECONDITIONING	H
If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF ar wait at least 10 seconds before conducting the next test.	nd
>> GO TO 2.	
2.DTC REPRODUCTION PROCEDURE	J
 CONSULT Start the engine. Turn the differential lock mode switch OFF. Drive at 20km/h (12 MPH) or less for approx. 1 minute on the curved road. Select "Self Diagnostic Result" mode of "DIFF LOCK". 	K
Is DTC "P18CE" detected?	L
 YES >> Proceed to diagnosis procedure. Refer to <u>DLN-267, "Diagnosis Procedure"</u>. NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>. NO-2 >> Confirmation after repair: Inspection End. 	M
Diagnosis Procedure	3456
1. CHECK DIFFERENTIAL LOCK POSITION SWITCH GROUND CIRCUIT	Ν
 Check the continuity between differential lock position switch harness connector and ground. 1. Turn the ignition switch OFF. 2. Disconnect differential lock position switch harness connector. 3. Check the continuity between differential lock position switch harness connector and ground. 	0
Differential lock position switch	— P

Differential lock	c position switch		Continuity
Connector	Terminal		Continuity
C16	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

P18CE DIFFERENTIAL LOCK POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

$\overline{2.\text{check}}$ differential lock position switch signal circuit

- 1. Disconnect differential lock control unit harness connector.
- 2. Check the continuity between differential lock control unit harness connector and differential lock position switch harness connector.

Differential lo	ck control unit	Differential lock	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
B77	12	C16	1	Yes

3. Check the continuity between differential lock control unit harness connector and ground.

Differential lo	ck control unit		Continuity	
Connector	Terminal		Continuity	
B77	12	Ground	No	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

3.CHECK DIFFERENTIAL LOCK POSITION SWITCH SIGNAL

1. Connect differential lock control unit harness connector.

2. Turn the ignition switch ON. CAUTION:

Never start the engine.

3. Check the voltage between differential lock position switch harness connector and ground.

Differential lock	c position switch		Voltage	
Connector	Terminal		(Approx.)	
C16	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning parts.

4.CHECK DIFFERENTIAL LOCK POSITION SWITCH

Check differential lock position switch. Refer to DLN-247. "Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace differential lock position switch. Refer to <u>DLN-283, "Removal and Installation"</u>.

5.CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector.

Check differential lock position switch pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> Replace differential lock control unit. Refer to DLN-281, "Removal and Installation".

NO >> Repair or replace the malfunctioning parts.

Component Inspection

INFOID:000000013478457

1. CHECK DIFFERENTIAL LOCK POSITION SWITCH

1. Turn the ignition switch OFF.

Remove differential lock position switch. Refer to <u>DLN-283, "Removal and Installation"</u>.



Check the continuity between differential lock position switch [3.

con	nector te	erminals.	Joshon Switch	
Differer position	ntial lock n switch	Condition	Continuity	
Terr	minal	While pulling rod (A) of differential lock position switch	Yes	The second secon
1	2	(Differential system is locked state.) While pushing rod (A) of differential lock posi- tion switch	No	ALDIA08472Z
		(Differential system is unlocked state.)		

Is the inspection result normal?

YES >> Inspection End.

>> Replace differential lock position switch. Refer to DLN-283, "Removal and Installation". NO

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P18D0 ABS SYSTEM

DTC Description

INFOID:000000013478458

[REAR FINAL DRIVE: MA248 (ELD)]

DTC DETECTION LOGIC

Malfunction is detected in ABS that is output from ABS actuator and electric unit (control unit) through CAN communication.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	Engine running and vehicle running	
D19D0	ABS SYSTEM	Signal (terminal)	ABS malfunction signal	
PTODU	(ABS system)	Threshold	_	
		Diagnosis delay time	—	

POSSIBLE CAUSE

ABS malfunction

FAIL-SAFE

No impact to vehicle behavior. (Differential lock system can operate.)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. DTC REPRODUCTION PROCEDURE

- 1. Drive at 30 km/h (19 MPH) or more for approximately 1 minute.
- 2. Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "P18D0" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-270, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to <u>GI-43, "Intermittent Incident"</u>.
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478459

1.PERFORM ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF DIAGNOSTIC RESULT

Select "Self Diagnostic Result" mode of "ABS".

Is any DTC detected?

YES >> Check the DTC. Refer to <u>BRC-55, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK TERMINALS AND HARNESS CONNECTORS

Check differential lock control unit pin terminals for damage or loose connection with harness connector. Is inspection result normal?

- YES >> After turning the ignition switch OFF, perform DTC confirmation procedure again. If DTC "P18D0" is detected, replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.
- NO >> Repair or replace the malfunctioning parts.

U1000 CAN COMM CIRCUIT

DTC Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

Differential lock control unit is not transmitting/receiving CAN communication signal for 2 seconds or more.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	E
		Diagnosis condition	When Ignition switch is ON.	
114000	CAN COMM CIRCUIT	Signal (terminal)	CAN communication signal	_
01000	(CAN communication circuit)	Threshold	-	F
		Diagnosis delay time	2 seconds or more	
POSSIBLE CACAN communityInternal malful	AUSE nication error inction of differential lock o	control unit		G
FAIL-SAFE When differenti gaged.	ial lock system is malfund	ctioning, fail-safe sta	atus activates and rear differential lock is disen-	
DTC CONFIR	MATION PROCEDURE			1
1.PRECONDI	TIONING			
If "DTC CONFII wait at least 10	RMATION PROCEDURE" seconds before conductir	has been previousling the next test.	y conducted, always turn ignition switch OFF and	J
>> G() TO 2			K
2 DTC REPR		=		
		-		I
 Turn the ig Perform "S 	nition switch OFF to ON. elf Diagnostic Result" mod	de of "DIFF LOCK".		
Is DTC "U1000"	" detected?			\mathbb{N}
YES >> Pro NO-1 >> To NO-2 >> Co	bceed to diagnosis proced check malfunction sympto nfirmation after repair: Ins	ure. Refer to <u>DLN-2</u> om before repair: Re pection End.	71, "Diagnosis Procedure". fer to <u>GI-43, "Intermittent Incident"</u> .	N
Diagnosis P	rocedure		INFOID:000000013478461	
Proceed to LAN	N-51, "Trouble Diagnosis F	-low Chart".		С

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DLN

INFOID:000000013478460

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000013478462

[REAR FINAL DRIVE: MA248 (ELD)]

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit communicate data but selectively reads required data only.

DTC DETECTION LOGIC

Detecting error during the initial diagnosis of CAN controller of differential lock control unit.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition			
		Diagnosis condition	When Ignition switch is ON.		
11010	CONTROL UNIT (CAN) [Control unit (CAN)]	Signal (terminal)	_		
01010		Threshold	—		
		Diagnosis delay time	—		

POSSIBLE CAUSE

Internal malfunction of differential lock control unit

FAIL-SAFE

When differential lock system is malfunctioning, fail-safe status activates and rear differential lock is disengaged.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.DTC REPRODUCTION PROCEDURE

- 1. Turn the ignition switch OFF to ON.
- 2. Perform "Self Diagnostic Result" mode of "DIFF LOCK".

Is DTC "U1010" detected?

- YES >> Proceed to diagnosis procedure. Refer to <u>DLN-272, "Diagnosis Procedure"</u>.
- NO-1 >> To check malfunction symptom before repair: Refer to GI-43, "Intermittent Incident".
- NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:000000013478463

1.PERFORM SELF DIAGNOSTIC RESULT

After erasing the DTC, perform DTC confirmation procedure again. Refer to <u>DLN-272, "DTC Description"</u>. <u>Is DTC "U1010" detected?</u>

YES >> Replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.

NO >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace the malfunctioning parts.

POWER SUPPLY AND GROUND CIRCUIT [REAR FINAL DRIVE: MA248 (ELD)] < DTC/CIRCUIT DIAGNOSIS > POWER SUPPLY AND GROUND CIRCUIT А Diagnosis Procedure INFOID:000000013478464 1. CHECK IGNITION SIGNAL VOLTAGE В 1. Turn the ignition switch OFF. 2. Disconnect differential lock control unit harness connector. 3. Check the voltage between differential lock control unit harness connector and ground. Differential lock control unit Voltage DLN (Approx.) Connector Terminal 7 B77 0 V Ground Turn the ignition switch ON. Е CAUTION: Never start the engine. Check the voltage between differential lock control unit harness connector and ground. F Differential lock control unit Voltage (Approx.) Connector Terminal 7 B77 Ground Battery voltage Is the inspection result normal? Н YES >> GO TO 3. NO >> GO TO 2. 2.CHECK IGNITION SIGNAL CIRCUIT 1. Turn the ignition switch OFF. Check fuse [No. 30 located in the fuse block (J/B)]. 2. Disconnect fuse block (J/B) harness connector. 3. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness 4 connector. Κ Differential lock control unit Fuse block (J/B) Continuity Connector Terminal Connector Terminal 7 7P B77 M4 Yes Check the continuity between differential lock control unit harness connector and the ground. 5 Differential lock control unit M Continuity Connector Terminal 7 B77 Ground No Ν Is the inspection result normal? YES >> Perform the trouble diagnosis for ignition power supply circuit. Refer to PG-13, "Wiring Diagram -BATTERY POWER SUPPLY - WITH Cummins 5.0L -". Ο NO >> Repair or replace the malfunctioning parts. 3.CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY VOLTAGE Ρ

1. Turn the ignition switch OFF.

2. Check the voltage between differential lock control unit harness connector and ground.

Differential lo	ck control unit		Voltage	
Connector	Terminal		(Approx.)	
B77	15	Ground	Battery voltage	

3. Turn the ignition switch ON.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

CAUTION: Never start the engine.

4. Check the voltage between differential lock control unit harness connector and ground.

Differential lo	ck control unit		Voltage
Connector	Terminal		(Approx.)
B77	15	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY CIRCUIT

- 1. Turn the ignition switch OFF.
- 2. Check fuse [No. 6 located in the fuse block (J/B)].
- 3. Disconnect fuse block (J/B) harness connector.
- 4. Check the continuity between differential lock control unit harness connector and fuse block (J/B) harness connector.

Differential lock control unit		Fuse block (J/B)		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
B77	15	M70	15R	Yes	

5. Check the continuity between differential lock control unit harness connector and the ground.

Differential lock control unit			Continuity	
Connector	Terminal		Continuity	
B77	15	Ground	No	

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit. Refer to <u>PG-13. "Wiring Diagram - BAT-</u> <u>TERY POWER SUPPLY - WITH Cummins 5.0L -"</u> or <u>PG-34. "Wiring Diagram - BATTERY</u> <u>POWER SUPPLY - WITH VK56VD -"</u>.

NO >> Repair or replace the malfunctioning parts.

5.check differential lock solenoid power supply voltage

- 1. Turn the ignition switch OFF.
- 2. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage	
Connector	Terminal		(Approx.)	
B77	9	Ground	Battery voltage	

3. Turn the ignition switch ON. CAUTION:

Never start the engine.

4. Check the voltage between differential lock control unit harness connector and ground.

Differential lock control unit			Voltage	
Connector	Terminal		(Approx.)	
B77	9	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6

6.CHECK DIFFERENTIAL LOCK SOLENOID POWER SUPPLY CIRCUIT

DLN-274

POWER SUPPLY AND GROUND CIRCUIT [REAR FINAL DRIVE: MA248 (ELD)]

< DTC/CIRCUIT DIAGNOSIS >

 Turn the ignition swi Check the 10A fuse Disconnect fusible li 	tch OFF. (#64). nk box LH connector.				
 Check the continuity ness connector. 	between differential lock	control unit harness conr	nector and fus	sible link box LH har-	
Differential lock control unit		Fusible link box LH		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
D77	0	E27 (Cummins 5.0L)) 1	No.	
B/7	9	9 E148 (VK56VD)		Yes	
. Check the continuity	between differential lock	control unit harness conn	ector and the	ground.	
Differential	ock control unit				
Connector	Terminal		- Continuity		
B77	9	Ground	No		
s the inspection result n	ormal?				
YES >> Perform the <u>TERY POW</u> <u>POWER SU</u> NO >> Repair or re .CHECK DIFFERENT	trouble diagnosis for pov <u>(ER SUPPLY - WITH C</u> <u>PPLY - WITH VK56VD -"</u> place the malfunctioning p IAL LOCK CONTROL UN	wer supply circuit. Refer t summins <u>5.0L</u> -" or <u>PG-3</u> parts. IIT GROUND	o <u>PG-13, "W</u> 84, "Wirin <u>g E</u>	iring Diagram - BAT- Diagram - BATTERY	
 Turn the ignition swi Check the continuity Differential let 	tch OFF. between differential lock	control unit harness conn	ector and gro	und.	
Connector	Terminal	-	Continuity		
	10				
B77		Ground		Yes	

Is the inspection result normal?

YES >> Inspection End.

>> Repair or replace the malfunctioning parts. NO

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DIFFERENTIAL LOCK INDICATOR LAMP

Component Function Check

1. DIFFERENTIAL LOCK INDICATOR LAMP OPERATION CHECK

Check that differential lock indicator lamp turns ON after the ignition switch is turned ON (engine stop) and turns OFF after the engine is started.

Is the inspection result normal?

YES >> Inspection End.

NO >> Proceed to <u>DLN-276, "Diagnosis Procedure"</u>.

Diagnosis Procedure

INFOID:000000013478466

INFOID:000000013478465

1.PERFORM SELF DIAGNOSTIC RESULT

Select "Self Diagnostic Result" mode of "DIFF LOCK".

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to <u>DLN-220, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK DIFFERENTIAL LOCK MODE SWITCH

Perform the trouble diagnosis for differential lock mode switch. Refer to <u>DLN-243, "Diagnosis Procedure"</u>.

Is the inspection results normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning parts.

3. CHECK DIFFERENTIAL LOCK INDICATOR LAMP SIGNAL

1. Start the engine. CAUTION:

Stop the vehicle.

- 2. Change 4WD shift switch to 4L.
- 3. Change differential lock mode switch to ON.
- 4. Check "INDICATOR" in "Data Monitor" mode of "DIFF LOCK".

Does the item on "Data Monitor" indicate "On" or "FLASH"?

- YES >> Perform the trouble diagnosis for combination meter. Refer to <u>MWI-25, "On Board Diagnosis</u> <u>Function"</u>.
- NO >> Replace differential lock control unit. Refer to <u>DLN-281, "Removal and Installation"</u>.

DIFF LOCK INDICATOR LAMP DOES NOT TURN ON WITH DIFFERENTIAL LOCK SWITCHED ON [REAR FINAL DRIVE: MA248 (ELD)] < SYMPTOM DIAGNOSIS > SYMPTOM DIAGNOSIS А DIFF LOCK INDICATOR LAMP DOES NOT TURN ON WITH DIFFEREN-TIAL LOCK SWITCHED ON В Inspection Procedure INFOID:000000012544490 SYMPTOM: DIFF LOCK indicator lamp does not turn ON when turning differential lock mode switch to "ON" after engine start. DIAGNOSTIC PROCEDURE DLN 1. CHECK DIFF LOCK INDICATOR LAMP Confirm the DIFF LOCK indicator lamp proves out when ignition switch is turned ON. Е Is the inspection result normal? YES >> GO TO 2. NO >> Go to DLN-276, "Component Function Check". F 2.CHECK SELF-DIAGNOSTIC RESULTS Select "Self Diagnostic Result" mode of "DIFF LOCK". Refer to DLN-215, "CONSULT Function". Is any DTC detected by self-diagnosis? YES >> Check the malfunctioning system. Refer to DLN-220, "DTC Index". NO >> GO TO 3. Н 3.CHECK DIFFERENTIAL LOCK MODE SWITCH OPERATION Check differential lock mode switch. Refer to DLN-243, "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 4. NO >> Repair component, harness or connector. 4.CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT Check differential lock control unit power supply and ground circuit. Refer to DLN-273, "Diagnosis Procedure". Is the inspection result normal? Κ >> Replace the differential lock control unit. Refer to DLN-281, "Removal and Installation". YES NO >> Repair harness or connector. L Μ Ν

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DIFF LOCK INDICATOR LAMP FLASHES WHILE DRIVING < SYMPTOM DIAGNOSIS > [REAR FINAL DRIVE: MA248 (ELD)]

DIFF LOCK INDICATOR LAMP FLASHES WHILE DRIVING

Description

INFOID:000000012544491

The DIFF LOCK indicator lamp will flash once every 2 seconds when the differential lock system is in standby condition. Standby condition is the time between when the differential lock mode switch is turned ON and when the differential lock control unit see's all conditions are met to engage the differential lock. The DIFF LOCK indicator lamp should be OFF if there has been a fault detected. For more information regarding the differential lock system operation, refer to the Owner's Manual.

Inspection Procedure

INFOID:000000012544492

SYMPTOM: DIFF LOCK indicator lamp sometimes flashes while driving.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

Select "Self Diagnostic Result" mode of "DIFF LOCK". Refer to <u>DLN-215. "CONSULT Function"</u>. <u>Is any malfunction detected by self-diagnosis?</u>

YES >> Check the malfunctioning system. Refer to <u>DLN-220, "DTC Index"</u>.

NO >> GO TO 2.

2. CHECK DIFFERENTIAL LOCK MODE SWITCH

Perform trouble diagnosis for differential lock mode switch. Refer to <u>DLN-243, "Diagnosis Procedure"</u>. Is the inspection result normal?

YES >> Condition is intermittent. Refer to <u>GI-43. "Intermittent Incident"</u>.

NO >> Repair or replace malfunctioning component.

PERIODIC MAINTENANCE REAR DIFFERENTIAL GEAR OIL

Inspection

OIL LEAKAGE

- · Check that oil is not leaking from final drive assembly or around it.
- When oil is leaking, drain all gear oil, and then fill with specified amount of gear oil. Refer to <u>DLN-279</u>, <u>"Draining"</u>, <u>DLN-279</u>, <u>"Refilling"</u>.

CAUTION:

Oil volume cannot checked by oil level height. NOTE:

Oil is refilled up to filler plug hole.

OIL LEVEL

• Remove filler plug (1) and check oil level (A) from filler plug hole as shown.

CAUTION:

Do not start engine while checking oil level.

• Install the filler plug and tighten to specification.

Filler plug torque

e : Refer to <u>DLN-292, "Exploded</u> <u>View"</u>.



INFOID:000000013312710

INFOID:000000013312711

Draining

- 1. Stop engine.
- 2. Remove drain plug (1) and drain gear oil.
- 3. Install the drain plug to specification.

Drain plug torque

: Refer to <u>DLN-292</u>, "Exploded_ View".



Refilling

- Drain all gear oil. Refer to <u>DLN-279, "Draining"</u>. CAUTION: Drain gear oil until gear oil start to drip.
- 2. Remove filler plug (1).
- 3. Fill with specified amount of gear oil.



[REAR FINAL DRIVE: MA248 (ELD)]

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Oil grade and viscosity	: Refer to <u>MA-13, "VK56VD</u> Gasoline Engine : Fluids		
	and Lubricants" or, MA-59.		
	gine : Fluids and Lubri- cants".		
Oil capacity	: Refer to <u>MA-13, "VK56VD</u> <u>Gasoline Engine : Fluids</u> <u>and Lubricants"</u> or, <u>MA-59,</u> <u>"Cummins (5.0L V8D) En-</u> <u>gine : Fluids and Lubri-</u> <u>cants"</u> .		

NOTE:

Oil is refilled up to filler plug hole.

Oil volume cannot checked by oil level height.

4. Install the filler plug and tighten to specification.

Filler plug torque

: Refer to <u>DLN-292, "Exploded</u> <u>View"</u>.

INFOID:000000012544500 В **RETRACTOR : Removal and Installation".** DLN Ε 6. Remove the nuts (B) disconnect the harness connector (A) from 日ミ the differential lock control unit (1) and remove differential lock (B) control unit (1). F ⟨⊐ : Front

INSTALLATION

Installation is in the reverse order of removal.

Tighten the differential lock control unit nuts to the specified torque.

Differential lock control unit nuts : 3.5 N·m (0.36 kg-m, 31 in-lb)

Removal and Installation

- 1. Disconnect the battery or batteries. Refer to PG-174, "Battery Disconnect".
- 2. Remove jack and tools.
- 3. Remove upper bracket of center seat belt retractor and belt assembly. Refer to SB-14, "SEAT BELT

DIFFERENTIAL LOCK CONTROL UNIT

- Reposition rear panel out of the way. Refer to <u>INT-30, "Removal and Installation"</u>.
- Reposition the carpet to access differential lock control unit to disconnect harness connector.

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[REAR FINAL DRIVE: MA248 (ELD)]

DIFFERENTIAL LOCK MODE SWITCH

Exploded View

INFOID:000000013516005



10. Mask

Removal and Installation

REMOVAL

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7.

- 1. Remove instrument lower panel LH, refer to IP-22. "Removal and Installation".
- 2. Remove screws from upper switch carrier.
- 3. Remove upper switch carrier from instrument lower panel LH.
- Using a suitable tool, release pawls and remove differential lock mode switch. 4.

INSTALLATION

Installation is in the reverse order of removal.

INFOID:000000013516006

DIFFERENTIAL LOCK POSITION SWITCH

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: MA248 (ELD)]

DIFFERENTIAL LOCK POSITION SWITCH

Removal and Installation

REMOVAL

CAUTION:

- Be careful not to damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing rear final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from rear final drive assembly/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.
- 1. Drain rear final drive gear oil. Refer to <u>DLN-279, "Draining"</u>.
- 2. Remove rear propeller shaft. Refer to DLN-133, "Removal and Installation".
- 3. Remove rear axle shafts (LH/RH). Refer to RAX-6, "Removal and Installation".
- 4. Remove the carrier cover. Refer to <u>DLN-289</u>, "Removal and Installation".
- 5. Remove differential lock solenoid harness connector (B) bolt and disconnect differential lock position harness connector (A) from the differential lock position switch.

<⊐ : Front

7. Remove side bearing caps using suitable tool.

Do not use power tool to remove side bearing caps.



- For installation, apply a paint matching mark (1) on one side of side bearing cap.
 CAUTION:
 - Side bearing caps are line-board for initial assembly. The matching marks are used to install them in their original positions.
 - For matching mark, use paint. Do not damage side bearing cap.





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INFOID:000000012544501

CAUTION:

DIFFERENTIAL LOCK POSITION SWITCH

< REMOVAL AND INSTALLATION >

8. Install Tool (A) and Tool (B) to spread the gear carrier.

Tool (A) : — (J-51043) (B) : — (J-24385-C)



9. Support differential assembly with strap and remove enough to disengage differential lock position switch.



10. Remove differential lock position switch.

INSTALLATION

- 1. Apply sealant to threads of differential lock position switch.
 - Use Genuine Silicone RTV or equivalent. Refer to <u>GI-22, "Recommended Chemical Products and Seal-ants"</u>.

CAUTION:

Remove old sealant adhering to gear carrier and differential lock position switch. Also remove any moisture, oil, or foreign material adhering to application and gear carrier and differential lock position switch.

2. Install differential lock position switch on gear carrier and tighten differential lock position switch bolts with the specified torque. Refer to <u>DLN-292</u>, "Exploded View".



 Slide the differential assembly back into position.
 CAUTION: Make sure the anti-rotation tabs (1) are aligned vertically.



DIFFERENTIAL LOCK POSITION SWITCH

< REMOVAL AND INSTALLATION >

4.

Align paint matching mark on side bearing caps with that on gear carrier and install side bearing caps on gear carrier without

tightening to specification. **CAUTION:**

Do not tighten at this point. This allows further tightening of side bearing adjusters.



5. Connect differential lock solenoid harness (B) and differential lock position switch harness connector (A). Then install it to gear carrier, tighten to the specified torque. Refer to DLN-292. "Exploded View".

<⊐ : Front



- 6. Adjust backlash of drive gear and drive pinion. Refer to DLN-292, "Disassembly and Assembly".
- 7. Check total preload torque. Refer to DLN-292, "Disassembly and Assembly".
- 8. Check tooth contact. Refer to DLN-292, "Disassembly and Assembly".
- 9. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to DLN-292. "Disassembly and Assembly".
- 10. Installation of the remaining components is in the reverse order of removal. **CAUTION:**

Fill the rear final drive assembly with recommended differential gear oil. Refer to DLN-279, "Refilling".

[REAR FINAL DRIVE: MA248 (ELD)]

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FRONT OIL SEAL

Removal and Installation

REMOVAL

- 1. Drain the differential gear oil. Refer to <u>DLN-181, "Draining"</u>.
- 2. Disconnect rear propeller shaft and support the propeller shaft using suitable wire. Refer to <u>DLN-133</u>, <u>"Removal and Installation"</u>.
- 3. Remove the axle shaft assemblies (LH/RH). Refer to RAX-6. "Removal and Installation".
- 4. Measure the total preload torque. Refer to <u>DLN-189</u>, "Disassembly and Assembly".
 - **NOTE:** Record the total preload torgue measurement.
- 5. Remove the drive pinion nut using suitable tool (A). CAUTION:
 - Do not use power tool to remove drive pinion lock nut.
 - Do not reuse drive pinion lock nut or washer.



 Put matching marks (A) on the companion flange and drive pinion using paint.
 CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



7. Remove the companion flange using suitable tool (A).



INFOID:000000012544502

Remove the front oil seal using Tool (A).
 CAUTION:
 Do not reuse front oil seal.

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Tool (A) : — (J-26941)
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INSTALLATION

- 1. Clean the threads and splines of the drive pinion.
- Apply multi-purpose grease to the lips of the new front oil seal then drive the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool number : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips and differential gear oil to the circumference of the new front oil seal.



- 3. Apply spline sealant 1.5mm (0.059 in) diameter bead 360 degrees around splines inside of the companion flange and install it on the drive pinion, aligning the matching marks.
 - Use spline sealant (Loctite 565) or equivalent. Refer to <u>GI-22</u>, "Recommended Chemical Products and <u>Sealants"</u>.
- 4. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

(J-45012)

Tool number (A): —

"A" = Total preload torque "T"

Additional preload torque

Total preload torque "T"

CAUTION:

"A"

Do not use power tool to install drive pinion lock nut.

- Do not reuse drive pinion lock nut or washer.
- 5. •Measure the total preload torque as necessary using Tool (B).
- a. Use the Pre-measured total preload torque recorded during removal and add an additional preload torque "A" to the recorded pre-measured value. Use this calculated value when adjusting the total preload torque "T", when not replacing the collapsible spacer.

Pre-measured total preload torque + Additional torque

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 Tighten drive pinion lock nut in increments and measure total preload torque several times to prevent overtightening.
 CAUTION:

Do not loosen drive pinion lock nut to adjust the total preload torque. If the total preload torque exceeds the specifications, replace the collapsible spacer and tighten it again to adjust. Refer to <u>DLN-189, "Disassembly and Assembly"</u>.

: Refer to DLN-306, "Pre-

: Refer to DLN-306, "Pre-

load Torque".

load Torque".

c. Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the pinion bearings. CAUTION:

After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.

6. Installation of the remaining components is in the reverse order of removal. **CAUTION:**

Check the differential gear oil level after installation. Refer to **DLN-181**, "Inspection".
CARRIER COVER

Removal and Installation

REMOVAL

- 1. Drain the differential gear oil. Refer to <u>DLN-279, "Draining"</u>.
- 2. Remove the rear stabilizer bar clamps and bushings and position rear stabilizer bar out of the way. Refer to <u>RSU-6. "Exploded View"</u>.
- 3. Disconnect the parking brake cable (A) and brake tube (B) from the carrier cover.

- Remove the carrier cover bolts and separate the carrier cover from the gear carrier.
 CAUTION:
 Do not demons the meting ourface.
 - Do not damage the mating surface.
 - Do not insert flat-bladed screwdriver, this will damage the mating surface.

INSTALLATION

- Apply medium strength thread locking sealant into the threaded holes for the carrier cover. install dry carrier cover gasket and carrier cover and bracket and tighten carrier cover bolts to the specification. Refer to <u>DLN-292</u>, "<u>Exploded View</u>".
 - CAUTION:
 - If carrier cover gasket is damaged replace it.
 - Remove any moisture, oil, or foreign material adhering to the application and mating surfaces. NOTE:

Use Genuine Medium Strength Locking Sealant or equivalent. Refer to <u>GI-22, "Recommended Chemical</u> <u>Products and Sealants"</u>.

- 2. Connect the parking brake cable and brake tube to the carrier cover.
- 3. Fill the rear final drive assembly with recommended differential gear oil. Refer to DLN-279, "Refilling".

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UNIT REMOVAL AND INSTALLATION REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:000000013407897



- 4. Rear leaf spring
- 7. Stabilizer bar
- 10. Connecting rod
- ∠⊐ Front

1.

Removal and Installation

REMOVAL

- **CAUTION:**
- Do not damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from final drive/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

9.

Stabilizer bar bushing

12. Bumper assembly

- Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft using 1. suitable wire. Refer to DLN-132, "Exploded View".
- 2. Disconnect the rear final drive air breather hose from the rear final drive assembly.
- Disconnect the following components from the rear final drive assembly. 3.
 - Brake tube block connectors. Refer to <u>BR-25, "REAR : Exploded View"</u>.
 - ABS sensor wire harness. Refer to <u>BRC-163</u>, "Removal and Installation".

DLN-290

- 5. Rear spring lower seat
 - 8. Stabilizer bar clamp
 - 11. Connecting rod bracket

INFOID:000000012544504

REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

- Parking brake cable (A).
- Brake tube (B).

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Revision: March 2016

[REAR FINAL DRIVE: MA248 (ELD)]

UNIT DISASSEMBLY AND ASSEMBLY **REAR FINAL DRIVE**

Exploded View

INFOID:000000013296324



- Drive pinion lock nut 1.
- Front oil seal 4.
- 7. Drain plug
- Ring gear bolts 10.
- 13. Filler plug
- 16. Side bearing adjusting shim RH
- 19. Drive pinion washer
- 22.

17. Side bearing assembly RH 20. Drive pinion rear bearing

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Differential lock sensor connector 23.

Disassembly and Assembly

DISASSEMBLY

NOTE: If disassembly is being done on-vehicle, perform the following prior to disassembly:

- Companion flange assembly 3.
- 6. Collapsible spacer
- 9. Side bearing adjusting shim LH
- Carrier cover bolts 12.
- 15. Carrier cover gasket
- 18. Drive pinion and drive gear assembly
- 21. Bearing cap bolts
- 24. Bracket

INFOID:000000012544505

Revision: March 2016

DLN-292

Drive pinion lock nut washer

Drive pinion front bearing

Side bearing assembly LH

Differential lock position switch

Differential assembly

Carrier cover

< UNIT DISASSEMBLY AND ASSEMBLY >

- Disconnect the propeller shaft from the rear final drive and support the propeller shaft using suitable wire. Refer to <u>DLN-133, "Removal and Installation"</u>.
- Remove the spare tire.

Differential Assembly

 Remove the carrier cover bolts, carrier cover and gasket. NOTE: The carrier cover gasket is reusable. Only replace the carrier co

The carrier cover gasket is reusable. Only replace the carrier cover gasket if it is damaged.

Do not damage the mating surface.

2. Remove sensor connector bolt and disconnect differential lock solenoid connector.

- For proper reinstallation, paint matching marks on one side of side bearing cap.
 CAUTION:
 - Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.
 - For matching mark, use paint. Do not damage side bearing cap.



[REAR FINAL DRIVE: MA248 (ELD)]



Remove side bearing caps using suitable tool (A).
 CAUTION:
 Do not use power tool to remove side bearing caps.



- 5. Remove differential case assembly.
- a. Attach Tool (A) to gear carrier.



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< UNIT DISASSEMBLY AND ASSEMBLY >

b. Attach Tool (B) to Tool (A) and position Tool (C) in the proper orientation to measure the axle housing spread.

> Tool number (A): — (J-51043) (B): — (J-24385-C) (C): — (J-45101)

WARNING:

Be cautious when using Tool (A,B), the differential case assembly is heavy and could cause serious injury. CAUTION:

- Using a dial indicator (C) do not exceed a spread of 0.381mm (0.015 in) when using axle housing spreader.
- Remove Tool from gear carrier immediately after differential case removal, to avoid damage to gear carrier.
- Remove side bearing outer races and side bearing adjusting shims. Keep side bearing and outer races together. Do not mix them up. Also, keep side bearing adjusting shims together with bearings. CAUTION:
 - If reusing side bearing outer races and side bearing adjusting shims:
 - Do not mix them up.
 - Tag the side bearing outer races and the side bearing adjusting shims so they are installed in the same position they were removed from.
- 7. Remove side bearing using Tool (A) and suitable tool.

Tool (A): — (J-51047)

CAUTION:

- Engage puller jaws in groove (🖛) to prevent damage.
- To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.
- Do not reuse side bearing if removed. Replace side bearing and bearing outer race as a set.

NOTE:

It is not necessary to remove side bearing except if it needs to be replaced.



Use paint for matching marks. Do not damage differential case or drive gear

[REAR FINAL DRIVE: MA248 (ELD)]



< UNIT DISASSEMBLY AND ASSEMBLY >

9. Remove drive gear bolts.

Tool (A)

: — (J-51044)

CAUTION:

• Secure the differential assembly in a vise using Tool (A).

- Drive gear bolts are left hand threaded.
- Do not damage drive gear by removing bolts improperly.
- 10. Tap the drive gear off the differential assembly uniformly using suitable tool.

CAUTION:

- Tap evenly all around to keep drive gear from binding.
- Do not pry.
- Do strike top of drive gear bolts to remove the drive gear.

NOTE:

Do not disassemble the differential assembly, it is not serviceable. Replace it as an assembly if necessary.

Drive Pinion Assembly

NOTE:

- If assembly is being done on-vehicle, perform the following prior to after assembly:
- Install the propeller shaft to the rear final drive. Refer to <u>DLN-133</u>, "<u>Removal and Installation</u>".
- Install the spare tire.
- 1. Remove differential case assembly. Refer to <u>DLN-292</u>, "Disassembly and Assembly".
- 2. Remove drive pinion lock nut and washer using suitable tool (A).



 Put matching marks on the companion flange at location (A) and drive pinion using paint as shown.
 CAUTION:

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



- 4. Remove companion flange using a suitable tool (A). CAUTION:
 - Do not reuse the deflector.





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< UNIT DISASSEMBLY AND ASSEMBLY >

5. Remove front oil seal using Tool (A).

Tool number : — (J-26941)

CAUTION: Do not damage gear carrier.



Remove drive pinion assembly using Tool (A).
 CAUTION:
 Do not drop drive pinion assembly.

Tool number : — (J-44421)



- 7. Remove drive pinion front bearing thrust washer.
- Remove drive pinion front bearing.
 CAUTION:
 Do not reuse drive pinion front bearing.
- 9. Remove collapsible spacer from drive pinion assembly and discard collapsible spacer. CAUTION:

Do not reuse the collapsible spacer.

- Remove drive pinion rear bearing and drive pinion washer using suitable tool (A).
 NOTE:
 - The drive pinion washer is matched to the carrier for proper drive pinion height. No drive pinion height adjustment is necessary if reusing original drive pinion washer.

CAUTION:

- Do not reuse drive pinion rear bearing.
- Do not discard drive pinion washer, reuse if not damaged.
- 11. Clean threads and splines of the drive pinion, if reusing drive pinion.
- 12. Tap drive pinion front and rear bearing outer races uniformly using suitable tool (A) to remove.
 - CAUTION:
 - Do not reuse bearing outer races. Replace bearing and outer races as a set.
 - Do not damage gear carrier.





INSPECTION AFTER DISASSEMBLY

Clean and inspect the disassembled parts. If part are worn or damaged, follow the measures below.

Drive Pinion and Drive Gear

Revision: March 2016

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< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: MA248 (ELD)]

• If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair or replace as necessary	Δ
• If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably,	\cap
 Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the num- bers of each drive pinion and drive gear before proceeding with assembly. 	В
 Bearing If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set). Bearing must be replaced with a new one whenever disassembled. 	С
Side Gear and Pinion Mate Gear	DLN
 If any cracks or damage are found on the surface of the teeth, replace case assembly. If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace case assembly. 	Е
 Drive Pinion Washer If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT. 	F
 Side Bearing Adjusting Shim If any chips (by friction), damage, or unusual wear are found, replace with new one. Refer to ASSEMBLY INSPECTION AND ADJUSTMENT. 	G
Gear CarrierIf any wear or cracks are found on the contact sides of gear carrier, replace with new one.	Н
Companion FlangeIf any chips or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.	I
Differential Case AssemblyIf any wear or cracks are found on the case assembly, replace with new one.	
ASSEMBLY	J
Drive Pinion Assembly NOTE:	K
 Connect the propeller shaft to the rear final drive. Refer to <u>DLN-133, "Removal and Installation"</u>. 	
Install the spare tire.	L
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< UNIT DISASSEMBLY AND ASSEMBLY >

 Install the new drive pinion front bearing outer race (2) and the new drive pinion rear bearing outer race (1), using Tools (A, B, C).

> Tool (A): — (J-8092) (B): — (J-51040) (C): — (J-51041)

CAUTION:

Do not reuse drive pinion front and rear bearing outer race. Replace with bearing as a set.



2. Install the drive pinion washer (2) to the drive pinion (1). Press on the new drive pinion rear bearing (3) using Tool (A) and suitable tool.

Tool (A): — (J-44412)

CAUTION:

- Install the drive pinion washer in the proper direction as shown.
- Do not reuse drive pinion rear bearing.
- Be sure that drive pinion rear bearing is properly seated to the drive pinion.
- 3. Assemble the new collapsible spacer to the drive pinion. CAUTION:

Do not reuse collapsible spacer.

- 4. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly into the gear carrier.
- 5. Apply differential gear oil to the new drive pinion front bearing and install it onto the pinion assembly. **CAUTION:**

Do not reuse drive pinion front bearing.

- 6. Install the companion flange and washer onto the drive pinion.
- 7. Seat the drive pinion bearing using Tool.

Tool — (J-51048)



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If no Tool is available to seat the drive pinion bearing, perform the following.

a. Using the old washer and drive pinion lock nut, tighten the drive pinion lock nut using suitable tool (A) until the hand-felt lash has been removed.

CAUTION:

Do not use power tool to seat the drive pinion bearing.

b. Remove the drive pinion lock nut, washer and companion flange using suitable tools.

8. Install the new front oil seal in evenly until it becomes flush with the gear carrier using Tool (A).

Tool : — (J-50982)

CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.
- Apply spline sealant 1.5 mm (0.059 in) diameter bead 360 degrees around splines inside of the pinion flange and install the companion flange to the drive pinion, aligning the matching marks.

CAUTION:

Do not damage companion flange, deflector or front oil seal.

- Use Spline Sealant (Loctite 565) or equivalent. Refer to <u>GI-22</u>, <u>"Recommended Chemical Products and Sealants"</u>.
- 10. Install the new drive pinion lock nut and washer and temporarily tighten using Tool (A).

Tool

: — (J-45012)

CAUTION:

- Do not use power tool to install drive pinion lock nut.
- Do not reuse drive pinion lock nut or washer.
- 11. Adjust the drive pinion preload torque using suitable tool (B).

Drive pinion bearing preload torque

: Refer to <u>DLN-306, "Pre-</u> load Torque"

Tool : — (J-25765-B)

- a. Tighten drive pinion lock nut in small increments and measure drive pinion bearing preload torque several times to prevent overtightening.
- B. Rotate the drive pinion several times, each time the drive pinion lock nut is tightened to seat the drive pinion bearings.
 CAUTION:
 - Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque. If the drive pinion bearing preload torque exceeds specification, disassemble and

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- replace the collapsible spacer and the drive pinion front bearing. Then tighten it again to adjust. Refer to <u>DLN-292, "Exploded View"</u>.
- After adjustment, rotate drive pinion back and forth two to three times to check for unusual noise, rotation malfunction, and other malfunctions.
- 12. Check companion flange runout. Refer to DLN-292, "Disassembly and Assembly".
- 13. Install differential case assembly. DLN-292, "Disassembly and Assembly".

Differential Assembly

NOTE:

- Do not disassemble differential assembly, it is not serviceable. Replace it as an assembly.
- 1. Secure the differential assembly in a vice using Tool (A)

Tool : — (J-51044)

2. Apply thread locking sealant the point (A) into the thread hole for the drive gear (1).

Use Genuine High Strength thread locking Sealant or equivalent. Refer to <u>GI-22</u>, "Recommended Chemical Products and <u>Sealants</u>".

CAUTION:

- Completely clean and degrease the drive gear back face, thread holes.
- Apply thread locking sealant onto the first and second threads under the thread hole chamfering of the drive gear on three or more different points.
- Use genuine high strength thread locking sealant or equivalent. Refer to <u>GI-22</u>, <u>"Recommended Chemical Products and Sealants"</u>.
- Align the matching mark of the differential case with the mark of the drive gear (if reusing drive gear), then hand thread all the drive gear bolts to the drive gear.
 CAUTION:
 - Drive gear bolts are left hand threaded.
 - Do not reuse drive gear bolts.





- 4. Draw the gear onto the differential case by tightening drive gear in a crisscross pattern. **CAUTION:**
 - Do not use power tool to tighten drive gear bolts
 - Drive gear bolts are left hand threaded.
- 5. Tighten the drive gear bolts to specification:

Drive gear torque specification : Refer to <u>DLN-189</u>, "Exploded <u>View"</u>.

CAUTION:

- Do not reuse drive gear bolts.
- Tighten drive gear bolts in a crisscross pattern.
- Drive gear bolts are left hand threaded.
- 6. Apply sealant to threads of differential lock position switch.
 - Use Genuine Silicone RTV or equivalent. Refer to <u>GI-22, "Recommended Chemical Products and Seal-ants"</u>.

CAUTION:

Remove old sealant adhering to gear carrier and differential lock position switch. Also remove any moisture, oil, or foreign material adhering to application and gear carrier and differential lock position switch.

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(A): — (J-51045 or J-51046) Tool (B): — (J-51047)

CAUTION:

- Do not reuse side bearing inner race if removed.
- Be sure that the side bearings are properly seated onto the differential case.
- 9. If Tool was removed after disassembly reinstall Tools (A, B, C).

Tool number (A): — (J-51043) (B): — (J-24385-C) (C): — (J-45101)

10. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into gear carrier.

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11. Be sure to align anti rotation tabs vertically.

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< UNIT DISASSEMBLY AND ASSEMBLY >

7. Install differential lock position switch on gear carrier and tighten differential lock position switch bolts to the specified torque.



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- 12. Apply multi-purpose grease to new sensor connector.
 - Do not reuse sensor connector.
- 13. Connect differential lock solenoid harness to new sensor connector. Then install new sensor connector to gear carrier and tighten to the specified torque.

14. Insert the left and right side bearing adjusting shims (2) in place between the side bearing outer race (3) and gear carrier (1) using Tool (A).

Tool (A): — (J-51042)

CAUTION:

- Install the side bearing adjusting shims in the proper direction as shown.
- Do not strike the side bearing adjusting shims with a hammer.

NOTE:

Use axle housing spreader tool if necessary.

15. Align paint matching marks on side bearing caps with those on gear carrier and install side bearing caps on gear carrier.

Side bearing cap bolt: Refer to DLN-189, "Explodedtorque specificationView".

CAUTION:

Tighten side bearing cap bolts in a criss cross pattern.

- Check and adjust backlash, tooth contact and total preload torque. Refer to <u>DLN-292</u>, "<u>Disassembly and</u> <u>Assembly</u>".
- 17. Install the carrier cover and gasket to the gear carrier. Refer to DLN-289, "Removal and Installation".

INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to <u>DLN-279, "Draining"</u>.
- Remove the axle shaft assemblies (RH/LH) before inspection and adjustment.
- Disconnect the propeller shaft from the rear final drive assembly and support the propeller shaft. Refer to <u>DLN-132. "Exploded View"</u>.
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to <u>DLN-289</u>, <u>"Removal and Installation"</u>.

Total Preload Torque

- 1. Rotate the drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
- 2. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.







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3. Measure total preload torque using Tool (A).

Total preload torque

: Refer to <u>DLN-306, "Pre-</u> load Torque".

Tool : ST3127S000 (J-25765-A)

NOTE:

Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque

- If the measured value is greater than specification, adjust as necessary.
- Adjust the drive pinion bearing preload torque first, then adjust the total preload torque by selecting side bearing adjusting shims.
- The differential gear case assembly must be removed to adjust the drive pinion bearing preload.

If the total preload torque is	greater than specification	L
On drive pinion bearings	: Replace collapsible spacer.	_
On side bearings	: Use thinner side bearing adjusting washers by the same amount on each	F
	side. Refer to <u>DLN-202, "Preload</u> <u>Torque"</u> .	G
If the total preload torque is	less than specification	Н
On drive pinion bearings	: Tighten drive pinion lock nut.	
On side bearings	: Use thicker side bearing adjusting washers by the same amount on each side. Refer to <u>DLN-202, "Preload</u> Torque"	I

Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

- 1. Thoroughly clean drive gear and drive pinion teeth.
- 2. Apply red lead to the drive gear.
 - Apply red lead to both faces all gears then check all gears.





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< UNIT DISASSEMBLY AND ASSEMBLY >

 Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown. CAUTION:

Check tooth contact on drive side and reverse side.



X mm (in)

Drive

(Heel contact)

surface

(Face contact)

Drive

surface

SDIA0517E

PDIA0440E

4. If the tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X).







Backlash

Revision: March 2016

1. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash : Refer to DLN-306, "Backlash".

• If the backlash is outside of the specification, change the thickness of each side bearing adjusting shim.

If the total preload torque is greater than specification



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On drive pinion bearings	: Replace collapsible spacer.	E
On side bearings	: Use thinner side bearing adjusting washers by the same amount on each side. Refer to <u>DLN-306, "Preload</u> <u>Torque"</u> .	F
If the total preload torque is	less than specification	G
On drive pinion bearings	: Tighten drive pinion lock nut.	
On side bearings	: Use thicker side bearing adjusting washers by the same amount on each	Н
	side. Refer to <u>DLN-306, "Preload</u>	

CAUTION:

Do not change the total thickness of side bearing adjusting shims as it will change the total preload torque.

Companion Flange Runout

- Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool. Refer to <u>DLN-307, "Companion Flange Runout"</u>.
- 2. If the runout is outside the runout limit, follow the procedure below to adjust.
- a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
- b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
- c. If the runout is still outside of the runout limit after replacing the companion flange. Replace the rear final drive assembly. Refer to <u>DLN-290</u>, "<u>Removal and Installation</u>".



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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000012544506

	4W	/D	
Applied model	VK56VD	Cummins 5.0L	
	(PRO-4X)		
Final drive model	MA248	(ELD)	
Gear ratio	3.357	3.916	
Number of pinion gears	4		
Number of teeth (Drive gear / drive pinion)	47/14	47/12	
Oil capacity (Approx.)	2.60 ℓ (5-1/2 US pt, 4-5/8 Imp pt)		
Drive pinion adjustment spacer type	Collap	osible	

Preload Torque

INFOID:000000013407950

PRELOAD TORQUE - REMOVAL AND INSTALLATION [WITHOUT REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg-m, in-lb)

Item	Standard
Pre-measured total preload torque [measured before removal of drive pinion lock nut] Maximum	6.47 (0.66, 57)
Additional preload torque "A" [add to pre-measured total preload torque during installation of new drive pinion lock nut]	0.35 - 0.58 (0.03 - 0.06, 3 - 5)
Total preload torque "T" [after installation of new drive pinion lock nut] = pre-measured total preload torque + additional preload torque	4.05 - 6.82 (0.40 - 0.68, 35 - 59)

PRELOAD TORQUE - DISASSEMBLY AND ASSEMBLY [REPLACING COLLAPSIBLE SPACER]

Unit: N·m (kg-m, in-lb)

Item	Standard
Drive pinion bearing preload torque	3.12 - 4.42 (0.32 - 0.45, 28 - 39)
Side bearing preload torque (reference value = total preload torque - drive pinion bearing preload torque)	0.50 - 1.70 (0.05 - 0.17, 4 - 15)
Total preload torque (total preload torque = drive pin- ion bearing preload torque + side bearing preload torque)	3.62 - 6.12 (0.37 - 0.62, 32 - 54)

Backlash

Unit: mm (in)

INFOID:000000013407951

Item	Standard
Drive gear to drive pinion gear	0.152 - 0.245 (0.0060 - 0.0096)

SERVICE DATA AND SPECIFICATIONS (SDS) D SPECIFICATIONS (SDS) [REAR FINAL DRIVE: MA248 (ELD)]

< SERVICE DATA AND SPECIFICATIONS (SDS)

Item

Companion Flange Runout

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Unit: mm (in) Limit

0.13 (0.0051) or less

Companion flange inner side

Companion flange face

Drive Pinion Washer

	Unit: mm (in)	
Thickness	Part number*	DLI
1.09 - 1.52	38154 EZ40A	

*: Always check with the Parts Department for the latest parts information.

Side Bearing Adjusting Washer

	Unit: mm (in)	_
Thickness	Part number*	Г
5.59 - 6.52	38453 EZ40A	

*: Always check with the Parts Department for the latest parts information.

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